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FOREWORD

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal.*

Table of Contents

	Page
Osseous Lesions Secondary to Infected Missile Wounds: Observations in Treatment With Antibiotics—*Joseph W. Batch* and *Francis H. Hughes, Jr.*	469
Starch Sponge as a Hemostatic Agent in Oral Surgery—*William R. Smith*	479
Collagen Tampons and Membranes Used Experimentally in Dogs—*Carl A. Broaddus, Jr., Philip N. Sawyer,* and *James W. Pate*	489
Ventilation and Oxygen Absorption in Thyroidism: An Analysis of Respiratory Tracings—*James C. Syner*	498
Nevocarcinoma—*Charles D. Bell*	504
Potassium in the Treatment of Cardiac Arrhythmias Due to Digitalis Intoxication—*Norman M. Scott, Jr.,* and *Marvin Moser*	511
The Portent of Pulmonary Infiltration or Fibrosis of Undetermined Cause —*Sidney A. Britten*	516
Lumbosacral Subarachnoid Tap for Saddle Block Anesthesia—*Frank C. Eames* and *Scott Whitehouse*	523
CASE REPORTS	
Fat Embolism—*Rodger L. Buck*	527
Guillain-Barré Syndrome—*Charles J. Tupper* and *Ray D. Foster*	532
Large Primary Omental Cyst Simulating Acute Appendicitis—*Justin E. Arata* and *Harvey J. Blanchet, III*	536
Unusual Findings in Vaginal Examination for Suspected Placenta Praevia—*Winfield D. Edgerton* and *Laurence G. Roth*	540
Involution of the Thymus Following Severe Burn—*John H. Davis, Eric Reiss, Curtis P. Artz,* and *William H. Amspacher*	545
Reflex Anuria—*Charles A. Moore* and *Claude C. Dodson*	549

Page

SERVICE ARTICLES

Doctors for the Armed Forces—*Lamont Pugh* 553
The Medical Estimate—*Spurgeon H. Neel* 573
Professional Integrity and Responsibility—*Jack M. Messner* 580
Officer Indoctrination in Preventive Medicine: The Air Force Plan—*Norman S. Talner, John Rizzolo,* and *Hugh W. Randel* 583
The Air Force Reserve Medical Training Program—*Arthur L. Streeter* .. 589

CLINICAL NOTES

An Inexpensive Dryer for Dental X-Ray Films—*Carlos F. Schuessler* .. 593
Modified Stretcher for Patients With Injuries of the Cervical Spine—*H. Todd Stradford* 596

DEPARTMENTS

Official Decorations 599
Program of A. M. A. Military Medicine Section, 23-25 June 601
Regular Medical Corps Officers Certified by Specialty Boards 603
Deaths 604
A Message From the A. M. A. 605
Publications by Officers of the Medical Services 607
Book Reviews 609
New Books 621

MONTHLY MESSAGE

Rear Admiral Lamont Pugh, in his article, "Doctors for the Armed Forces," reprinted on page 553 in this issue of the *Journal,* ably reviews the factors governing the average young doctor's rejection of a military medical career, and the failures and successes attending various plans designed to modify these factors. Last month's issue of the *Journal* contained a reference to the Womble report, and the text of a letter from Dr. John A. Hannah pointing out that at present there are more inducements to leave the armed services than there are to remain. Apart from any financial reasons, let us consider two major factors militating against a worth-while career for a doctor in the armed services—the geographic instability of military life, and the arbitrary limitations which military requirements impose on the choice and development of a medical career.

Unfortunately, because the size of the regular Medical Corps is comparatively small, it has become increasingly difficult to assure its members of the permanent assignments so vastly important to their families, the education of their children, and their professional establishment. Moves, sometimes as frequent

as after four months' duty at a station, have a disintegrating effect on a medical officer's morale.

Most physicians and surgeons in civilian life look forward to establishing themselves in community practice, or to an academic, industrial, or administrative position. Like all who desire to form ties with their chosen home, the surgeon wants to become known in and identified with his community, large or small; the internist looks forward to an eventual career as a consultant, and the specialist takes pride in the referrals which build his reputation. All become interested in their county or state medical organizations, and various national professional associations. Those in the academic world anticipate becoming well known in research or teaching, and many combine teaching with practice.

Although attempts are constantly being made to increase the attraction of a medical career in the armed services, they will not succeed until the medical officer is given the opportunity to establish his identity in his chosen work, and to test his skills and his relations with others in a reasonably permanent career situation. As he attains senior grade he should be allowed to develop a teaching, research, administrative, or specialty career in his chosen field on the basis of long-term tenure at a given station. In this way the best officers in the profession will emerge to gain their rewards; they will be sought after by junior officers and by prospective applicants for commission in the three services. This is not only possible within the framework of our existing laws, but necessary if the services are to attract and hold men of stature.

This is a long-range program, and will be difficult to accomplish. A pay scale moderately comparable to that existing in civil life should be instituted by Congress, and adequate housing or allowances provided to foster the dignity of the officer and his family. The first and simplest step might be the reintroduction of the 20-year retirement privilege. This is an incentive for men to remain in service after reaching early maturity, thus contributing their knowledge and experience. It is a stimulus to the sustained and purposeful effort necessary in building a reputation among both civilian and military members of the medical profession. Allowing retirement after 20 years, with a moderate pension, also keeps the services relatively young and provides for more rapid advancement.

Frank B. Berry

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Assistant Secretary of Defense
(Health and Medical)

OSSEOUS LESIONS SECONDARY TO INFECTED MISSILE WOUNDS

Observations in Treatment With Antibiotics

JOSEPH W. BATCH, *Colonel, MC, USA*
FRANCIS H. HUGHES, Jr., *Captain, MC, USA*

WOUNDS sustained as the result of warfare must be considered infected from the onset. The dynamic forces established by the penetration of the body by a missile produce considerable destruction of tissue[1] which will undergo necrosis and liquefaction, and be discharged from the wound. The rate of this process depends on the nature of the tissue involved, being more rapid for muscle than for fascia, and delayed when bone is involved. This necrosis provides a favorable medium for the growth of any organisms present. Although the heat of the explosion or that generated by transmission of the missile may make it a relatively clean object, the offending missile of itself may be incompatible with living tissue and may establish an unfavorable reaction. The missile may carry foreign material, including pathogenic organisms, into the depths of the tissue and thus establish an infected wound. The wound may also become infected by subsequent contact with soil or other infected material.

The initial treatment of such wounds is early thorough débridement. The wound is exposed, explored, all foreign material and devitalized tissue surgically removed, and copiously irrigated with saline. The wound is then dressed open to await further treatment, the nature of which depends upon the success of the initial débridement. An open wound is an infected wound; at least it is not bacteriologically sterile, although it may generally be considered clinically clean. The former condition is determined by cultural methods, and the latter by clinical inspection. Because an open wound is considered an infected wound, the clinical evaluation must determine the degree of local or general infection.

A locally infected wound without devitalized and necrotic tissue may be considered surgically clean, and closed secondarily

From Walter Reed Army Hospital, Washington, D. C.

by excision of the infected surface and approximation of the skin edges, or covered with a skin graft. Wounds with necrotic tissue must be treated further to remove such tissue before closure. If the infection is regional or general, the infection must be eradicated and the wound made clinically clean before closure is attempted.

A large number of technics have been devised in an attempt to combat wound infections. These include simple incision and drainage, the Carrel-Dakin technic, local application of antiseptic agents, use of maggots, urea, intravenous injection of dyes, sulfonamides, and antibiotics. War wounds involving the bone and producing a secondary osteitis form a group which have shown the greatest resistance to therapy, and it is this group with which we are particularly concerned.

During the treatment of more than 500 patients with osteitis secondary to war wounds, we have observed that results were dependent on the completeness of the saucerization, and the vigor and intensity with which antibiotic therapy was used. We have further observed that a number of organisms which varied in their sensitivity to the various antibiotics were present. Control of the infection depended on adequate concentrations of the antibiotic with the infected area, assisted by liberal excision of scar tissue and sclerotic bone during the course of the saucerization and the local instillation or irrigation with appropriate antibiotics to supplement the parenteral dosage. In cases where organisms were reported resistant to an antibiotic, to which that species was normally sensitive, suppuration often increased when the antibiotic was discontinued, but when the dosage of the antibiotic was increased, this suppuration decreased or ceased.

It has been reported that when organisms in vivo become resistant to antibiotics they tend to remain resistant, whereas artificially induced resistance in vitro experiments may often be reversed.[2-6] North and Christie[2] have demonstrated also that the resistance of virulent *Micrococcus pyogenes* var. *aureus* to penicillin in vivo did not decrease, but in vitro it did decrease. Segalove[5] found that the resistance of various strains of *M. pyogenes* var. *aureus* to penicillin was highly variable. He believed that resistance to penicillin was probably due to the formation of penicillinase in some cases, and the selection of naturally resistant cells in others. Spink and Ferris[4] found that four strains of *M. pyogenes* var. *aureus* which were made resistant to penicillin in vivo produced penicillinase and did not regain their sensitivity. Four other strains made resistant to penicillin in vitro did not produce penicillinase and regained their sensitivity.

Because our clinical impressions appeared to be at variance with the laboratory experiments of others, a study of a group of cases of chronic osteomyelitis was undertaken in an attempt to clarify this difference.

A series of 21 consecutive patients with chronically infected bone lesions secondary to war wounds were studied with serial bacteriologic examinations. The tibia was involved in 13 of these patients; the femur in two; the ulna in two; and the humerus, scapula, os calcis, and the acetabulum in one each.

Under aseptic conditions, cultures were made at weekly intervals and sensitivity tests were done. When the identity and sensitivity of the organisms were determined, the appropriate antibiotics were administered and surgical procedures were performed.

The natural defense mechanisms and reparative powers of the body must not be underestimated. Nothing should be done to interfere with these efforts, but the treatment should be directed toward assisting nature to eradicate infection and heal wounds. This was accomplished by surgical excision and wide saucerization of the infected area, and of all cicatricial barriers which reduced circulation to the site. Twice a day, 300,000 units of penicillin and 0.5 gram of streptomycin; and every six hours, 250 mg. of terramycin and aureomycin were given until healing was complete. Chloramphenicol was abandoned as a routine agent because of its toxicity. Fifty milligrams of polymyxin was administered twice a day to two patients but discontinued within 24 hours because of paresthesias about the mouth and tongue, and pain at the sight of injection. Trypsin proved to be a valuable adjunct to antibiotic therapy in patients with deep wounds and sinus tracts as well as in superficial suppurative wounds. Where soft tissue defects existed, adequate skin coverage was provided, and a high-protein, high-carbohydrate diet with vitamin supplement was given. Sympathectomy proved a valuable adjunct in wounds with poor skin coverage.

Cultures from a single wound may yield one or many different organisms. On culture, only three wounds produced a single organism, which in each instance was hemolytic *M. pyogenes* var. *aureus*. Multiple organisms were cultured from each of the other 18 wounds. Hemolytic *M. pyogenes* var. *aureus*, present in 17 of the wounds, was the most prevalent organism. *Pseudomonas aerogenosa* was cultured from eight wounds, *Micrococcus pyogenes* var. *albus* from seven, *Escherichia coli* from six, proteus species from five, *Aerobacter aerogenes* from four, paracolon bacillus and *Streptococcus faecalis* from two, and *Clostridium perfringens* from one (table 1).

TABLE 1.

Patient	Site of disease	Organisms isolated	Initial antibiotic sensitivity					Remarks	Results
			Pen	Ter	Aur	Chl	Str		
1	Scapula	Hemolytic *M. pyogenes* var. *aureus*	+	R	R	++	R	Pen-S to Pen-R; Aur-R to Aur-S	
		M. pyogenes var. *albus*	R	R	R	R	R	No change	Good
2	Tibia	Proteus species	R	R	R	++	R	No change	
		Ps. aerogenosa	R	R	R	++	R	No change	Good
		Str. faecalis	R	R	R	++	R	No change	
3	Tibia	Hemolytic *M. pyogenes* var. *aureus*	R	R	R	++	R	No change	
		A. aerogenes	++	++	++	++	R	Pen-S to Pen-R; Str-R to Str-S	
		Ps. aerogenosa	R	R	R	R	R	No change	Good
		Paracolon bacillus	R	R	R	R	R	Became S to Aur, Chl, and Ter	
4	Tibia	Hemolytic *M. pyogenes* var. *aureus*	R	++	++	+	R	Chl-S to Chl-R to Chl-S; became Ter-S to Ter-R to Ter-S	Fair
5	Tibia	*E. coli*	R	++	++	++	R	No change	
		Proteus species	R	R	R	R	R	No change	Poor

TABLE 1.—Continued

TABLE 1.—Continued

Patient	Site of disease	Organisms isolated	Initial antibiotic sensitivity					Remarks	Results
			Pen	Ter	Aur	Chl	Str		
5 (cont'd)	Tibia	*Ps. aerogenosa*	R	R	R	R	R	No change	
		Cl. perfringens	++	++	R	R	R	No change	
6	Femur	Hemolytic *M. pyogenes* var. *aureus*	R	R	R	++	R	Pen- and Ter-R to Pen- and Ter-S reverted to R	
		M. pyogenes var. *albus*	R	++	R	++	R	No change	Good
		E. coli	R	R	R	++	++	Ter- and Aur-R to S; Str-S to R to S	
		Proteus species	R	R	R	++	++	Chl- and Str-S to R to S	
		Ps. aerogenosa	R	R	R	R	R	No change	
7	Tibia	Hemolytic *M. pyogenes* var. *aureus*	R	R	R	++	R	Chl-S to R; Aur-R to S to R but Ter-S	
		M. pyogenes var. *albus*	++	++	++	++	++	No change	Good
		Paracolon bacillus	R	R	+	R	R	Aur-S to R; Ter-R to S to R then Str to S	

S = Sensitive
R = Resistant
Pen = Penicillin
Ter = Terramycin
Aur = Aureomycin
Chl = Chloramphenicol
Str = Streptomycin
+ = Mildly sensitive
++ = Sensitive

TABLE 1.—Continued

Patient	Site of disease	Organisms isolated	Initial antibiotic sensitivity					Remarks	Results
			Pen	Ter	Aur	Chl	Str		
8	Tibia	Hemolytic *M. pyogenes* var. *aureus*	++	++	++	++	R	Pen-S to R; Str to R to S	
		M. pyogenes var. *albus*	R	++	++	++	R	No change	Good
		E. coli	R	++	+	++	++	No change	
		Ps. aerogenosa	R	++	R	++	+	Became R to all	
9	Tibia	Hemolytic *M. pyogenes* var. *aureus*	R	++	++	++	++	No change	
		Gaffkya tetragena	–	–	–	–	–	Reported only once. No sensitivities reported.	Good
10 and 11	Right and left tibia	Hemolytic *M. pyogenes* var. *aureus*	R	R	R	++	R	Became R	
		E. coli	R	++	R	++	R	Became R	Fair
		Proteus species	R	R	R	++	R	No change	
		Ps. aerogenosa	R	R	R	++	R	Became R	
		Str. faecalis	R	R	R	R	R	No change	
12	Ulna	*M. pyogenes* var. *albus*	–	–	–	–	–	Reported only once. No sensitivities reported.	
		E. coli	R	R	R	R	++	No change	Poor

TABLE 1.—Continued

TABLE 1.—Continued

Patient	Site of disease	Organisms isolated	Initial antibiotic sensitivity					Remarks	Results
			Pen	Ter	Aur	Chl	Str		
13	Os calcis	Hemolytic *M. pyogenes* var. *aureus*	R	++	++	++	R	No change	Good
14	Tibia	Hemolytic *M. pyogenes* var. *aureus*	R	R	R	++	R	Chl-S to R; Pen-, Ter-, and Aur-R to S	
		M. pyogenes var. *albus*	R	R	R	R	R	Became R to Chl; S to Pen, Ter, and Aur	Good
15	Tibia	Hemolytic *M. pyogenes* var. *aureus*	R	R	R	R	R	No change	
		E. coli	R	++	++	++	R	No change	
		A. aerogenes	R	++	++	++	R	No change	Fair
		Diphtheroid bacilli	–	–	–	–	–	Reported only once. No sensitivities reported.	
16	Femur	Hemolytic *M. pyogenes* var. *aureus*	+	R	R	++	R	Pen- and Chl-S to R; Ter and Aur R to S	
		A. aerogenes	R	++	+	++	R	No change	
		Ps. aerogenosa	R	R	R	R	R	Became S to Chl	Good
		Diphtheroid bacilli	–	–	–	–	–	Reported once without sensitivities	

S = Sensitive
R = Resistant
Pen = Penicillin
Ter = Terramycin
Aur = Aureomycin
Chl = Chloramphenicol
Str = Streptomycin
+ = Mildly sensitive
++ = Sensitive

TABLE 1.—Continued

Patient	Site of disease	Organisms isolated	Initial antibiotic sensitivity					Remarks	Results
			Pen	Ter	Aur	Chl	Str		
17	Humerus	Hemolytic *M. pyogenes* var. *aureus*	R	++	++	++	R	Pen-R to S; all others S to R	
		M. pyogenes var. *albus*	++	++	++	R	R	Ter- and Aur-S to R	
		Streptococcus pyogenes	R	R	R	++	R	Reported only once	Good
		Proteus species	R	++	R	R	++	No change	
18	Acetabulum	Hemolytic *M. pyogenes* var. *aureus*	+	R	R	++	R	Pen-S to R; Aur-R to S	Fair
		A. aerogenes	R	+	R	++	R	No change	
19	Ulna	Hemolytic *M. pyogenes* var. *aureus*	R	++	++	++	++	No change	Poor
20	Tibia	Hemolytic *M. pyogenes* var. *aureus*	R	R	R	R	R	No change	
		M. pyogenes var. *albus*	R	R	R	++	R	No change	Poor
		Ps. aerogenosa	R	R	R	++	R	Chl-S to R; Str-R to S	
21	Tibia	Hemolytic *M. pyogenes* var. *aureus*	+	R	R	R	+	No change	Fair

S = Sensitive
R = Resistant

Pen = Penicillin
Ter = Terramycin

Aur = Aureomycin
Chl = Chloramphenicol

Str = Streptomycin

+ = Mildly sensitive
++ = Sensitive

Of the 52 organisms isolated, 31 consistently showed no changes in sensitivity; during the period of observation 21 organisms demonstrated changes in sensitivity (table 1). Some organisms initially reported as being sensitive to a certain antibiotic were later reported as being resistant to that antibiotic but sensitive to another. Some organisms which were first reported resistant were later reported sensitive to the same antibiotic. In the majority of these cases, even though the laboratory studies indicated that the organism had become resistant, the patients continued to improve clinically. When an organism became resistant to an antibiotic, the dosage of that antibiotic was doubled because the resistance was considered to be relative and as long as clinical response was observed, continued administration of the antibiotic was justified.

It would appear that the sensitivity of an organism to an antibiotic agent is not constant and may be lost, particularly with small doses of the antibiotic. When resistance develops toward one antibiotic, the organism may develop a sensitivity to another to which it has previously been resistant. Some organisms, which initially had been sensitive and had subsequently become resistant, later regained sensitivity with continued employment of an antibiotic (table 1).

The alteration in sensitivities caused speculation concerning the responsible mechanisms. Contamination of the wound with new organisms of the same species could account for these observations. In spite of all precautions cross-contamination is almost impossible to rule out. Patients in this series were observed at different times and were from widely separated sources. Cultures were taken from patients with osteomyelitis under conditions as aseptic as possible, and cross-contamination was believed at a minimum. The liberation of organisms from pockets within the wound was also a possible source of organisms of the same species with different susceptibility to the antibiotic tested.

It has long been recognized that environment causes many forms of life to be altered. Hence it can be theorized that such a phenomenon might be a factor in the altered susceptibility of organisms to antibiotics.

It was again demonstrated in the treatment of chronic osteomyelitis that persistence and patience are required for satisfactory results. Our results in the treatment of 21 patients with this condition were classified as good, fair, or poor. The result was considered good if drainage ceased completely and the wound remained healed four weeks after surgical treatment, fair if drainage ceased from four to eight weeks after operation, and poor if

the drainage continued more than eight weeks following surgical treatment. The following results were observed: Good, 11; fair, six; and poor, four.

A hemolytic *M. pyogenes* var. *aureus* resistant to all antibiotics, and *M. pyogenes* var. *albus* resistant to all antibiotics except chloramphenicol were cultured from one wound showing poor results. Another wound with poor results contained *E. coli* sensitive to aureomycin, chloramphenicol, and terramycin; proteus species and *Ps. aerogenosa* resistant to all antibiotics; and *Cl. perfringens* sensitive to penicillin and terramycin. All 21 wounds were healed at the end of 12 weeks.

SUMMARY AND CONCLUSIONS

Seldom is a single causative organism cultured from an infected wound. In our experience, *M. pyogenes* var. *aureus* is most consistently isolated from war wounds and was present in 81 percent of the patients treated.

Organisms in wounds under therapy, initially sensitive, may become resistant to antibiotics. Some organisms in vivo resistant to an antibiotic may lose their resistance under certain circumstances. Although sensitive organisms in wounds become resistant to certain antibiotics a clinical response may be observed following increased dosage with that antibiotic.

Proper surgical procedure is the major consideration in the treatment and control of infected war wounds. Adequate doses of antibiotics were a valuable adjunct in the control of osteomyelitis secondary to war wounds when preceded by adequate surgical treatment, and assisted in the prevention of secondary infection.

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STARCH SPONGE AS A HEMOSTATIC AGENT IN ORAL SURGERY

WILLIAM R. SMITH, *First Lieutenant, DC, USAR*

SINCE the time, nearly a decade ago, of the development of the cornstarch sponge,[1] this material has been advocated as an absorbable hemostatic agent and as a substitute for talc in glove lubrication.

The purpose of this report is to review the previous work with the starch sponge, and from this information and other tests, to point out a technic for the clinical use of starch as a hemostatic agent in various oral surgical procedures. In addition, an attempt is made to answer certain questions regarding the effect of certain mouth conditions on the starch sponge, and to draw some comparisons between starch and the other absorbable sponge materials used in oral surgery.

STARCH AS SUBSTITUTE FOR TALC

Much of the original work with this material was concentrated on investigation of a chemically modified starch powder as a substitute for talc in lubrication of surgical rubber gloves. When starch was used for this purpose, its physical properties were shown[2] to compare favorably with those of talc. Because of the possibility of wound contamination with powder, it was suggested that the absorbable starch might cause fewer adhesions and granulomatous responses than the nonabsorbable talc.

The importance of this problem has been pointed out by Weed and Groves,[3] who found that 22.6 percent of the rubber gloves during operations became perforated. A voluminous amount of literature by Owen,[4] Gardner,[5] and others has been written describing the hazards and sequelas of wound contamination with talc.

MacQuiddy and Tollman[6] experimented extensively with starch in this regard, and found it more absorbable and less irritating to peritoneal cavities of experimental animals than talc. Further-

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more, they were unable to produce any sensitivity to starch in experimental animals. In their studies Lee and others[2,7] reported nearly identical results.

In reporting the development of a sponge from starch, MacMasters and Blom[1] described it as a soft, pliable, resilient material which will absorb 16 times its weight of water, and suggested its use on gauze against wounds because the starch prevents adherence of the gauze to the tissues, thus facilitating its removal. The cost of the manufacturing process was estimated at between $.0667 and $.0948 per pound, depending on the volume of production.

Starch sponge may be autoclaved at 20-pound pressure; however, when sterilization is completed the autoclave must be turned on full vacuum until the starch is thoroughly dry. It has been found[8] that if the sponge is not dried at once, it becomes unfit for surgical use. If moisture on the wall of a container is not completely evaporated immediately, it may crust on the side of the starch sponge. It will be necessary to cut this off before insertion in a wound.

STARCH AS A HEMOSTATIC AGENT

Rosenfeld[9,10] has described his observations of the hemostatic effects of starch sponge both in experimental animals and in human subjects. His work with rabbits demonstrated the effectiveness of the sponge in controlling hemorrhage from the femoral veins, vena cava, and lesser vessels which were incised. Experimental animals treated with starch sponge survived, but all untreated (control) animals whose large veins were incised died within two minutes. Large pieces of starch sponge were left in the peritoneal cavity of animals, and in nearly all cases the incidence of adhesions at autopsy was remarkably slight. In 155 gynecologic and obstetric bleeding problems of various types, the starch sponge was used effectively as a hemostatic agent.

Correll and others[11] compared muscle implants of starch sponge, fibrin foam, and gelatin sponge in rats that were sacrificed at five-day intervals from the fifth to the hundredth postoperative day. They found that the starch sponge disappeared to gross inspection on the tenth day, but particles of microscopic size persisted from 40 to 50 days. Its absorption appeared associated with a mononuclear phagocytic response. Fibrin foam persisted in some cases for 100 days and was encapsulated by a dense fibroblastic wall. Gelatin sponge disappeared from histologic specimens before the thirtieth day. These authors also demonstrated that the usefulness of thrombin was enhanced by its application on an absorbable porous matrix.

These studies established that starch is absorbable, well tolerated by the body, and possesses hemostatic qualities.

HEMOSTATIC PROPERTIES OF THE STARCH SPONGE

Hemostasis is facilitated[12] by contact of a sponge to a wound, because blood is allowed to flow over a greater than normal surface. A roughened material such as starch sponge causes even greater fragmentation of platelets and accelerates coagulation. The dry starch sponge resembles finely textured stale bread, and microscopically appears as a finely divided porous mass. Rosenfeld attributed its hemostatic qualities to the gel formation by the starch, in which the sponge absorbs many times its weight of blood swelling to exert pressure and forming a mechanical obstruction to the flow of blood.

MacDonald[13] stated that in addition to the nonspecific hemostatic properties attributed to its spongy nature, starch aids coagulation by agglutination of red blood cells due to the high concentration of sugar products released on its surface.

HEMOSTATIC PROBLEMS IN ORAL SURGERY

The problem of hemostasis in oral surgery has been answered in varying degrees of effectiveness by many methods and materials. In operations on healthy patients, adherence to sound surgical principles and normal hemostatic mechanisms of the body will nearly always suffice, but occasionally in the presence of hemorrhagic diseases and other conditions the need arises for additional measures.

The methods used to handle unusual bleeding secondary to tooth extraction and other oral surgical intervention have generally consisted of pressure, either alone or in combination with various drugs, such as: ferric subsulfate solution (Monsel's), tannic acid, phenosulfonic acid, epinephrine solution, or ferric chloride. An important disadvantage of this was the occasional recurrence of bleeding when the gauze pack was removed and treatment had to be reinitiated.

DEVELOPMENT OF ABSORBABLE MATERIALS

When absorbable materials were developed the advantage of their absorbability was easily appreciated. The earlier substances, notably fibrin foam, gelatin sponge, and oxidized cellulose, have been used alone and as carriers for thrombin solutions, and for antibiotics as well. These materials have been left in alveolar bone or in other portions of the body and in most cases have been absorbed,[14] apparently without harm. Opinion varies, however, as to the comparative merits of these three substances.

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Starch sponge is also a well-tolerated, absorbable, hemostatic agent and is cheaper to produce than the other materials. This factor is especially important to installations or agencies, such as the armed services, which obtain these materials in large quantities.

Other comparisons indicate that the properties of gelatin sponge are destroyed by autoclaving, so that this material must be wrapped and sterilized by standard, dry-heat methods.[11] Oxidized cellulose cannot be autoclaved, but it may be boiled for three minutes.[14] The hemostatic effect of either thrombin or oxidized cellulose is greater than that of their combination.[15] This phenomenon is attributed to the marked acidity of oxidized cellulose and the limited range of activity of thrombin, which is inactive below pH 4.3 and above 10.0.[16]

EXPERIMENTS WITH THE STARCH SPONGE

According to the experiments I have done, starch sponge agitated with saliva at body temperature, both in the mouth and in a beaker, results in acid reactions between pH 6.0 and 7.0. Results were the same, within the limitations of the accuracy of the indicator paper. This is given as within a pH of 1, so it is concluded that the pH of 4.3 necessary to inactivate thrombin was not reached.

Frantz[17] stated that oxidized cellulose was unsuitable for use in open reductions of osseous fractures because the acidity produced inhibited callus formation. The response of bone to starch sponge has been observed[18] clinically to be very satisfactory. Because starch is a polysaccharide, and theoretically subject to some dissolution by salivary enzyme action, the question arose as to whether the sponge could be kept in the mouth for a sufficient time. Biochemists[8] maintain that unless each mouthful of food is chewed innumerable times, very little digestion takes place in the mouth. Starch sponge is not subject to this type of masticatory action and sufficient saliva for digestion would not contact the bulk of the sponge. According to an investigator,[8] no significant digestion of starch by saliva, with water as a control, at 37.5° C. for two hours, was noted.

A new hemostatic agent is not needed in routine procedures, yet in this clinical study the starch sponge was used in many normal subjects. There were two reasons for this. First, the number of patients with abnormally severe operative and postoperative hemorrhage were not sufficient for study and, second, it was desired to establish a base line of effectiveness, tissue tolerance, and healing in patients with and without hemorrhagic conditions.

TECHNIC OF USE

The starch sponges, about 1 by 1 by 2 cm., were sterilized in a small, widemouthed, screw-topped jar. Sterilized starch sponge maintains a somewhat rigid but spongy consistency on storage and may be used in its dry form, or after it has been moistened. But moistening, which was done by spraying sterile normal saline solution on the sponge with a syringe, was found to have a beneficial effect on the working properties of the sponge. Too much water causes the sponge to become soft, doughy, and too slippery for easy handling.

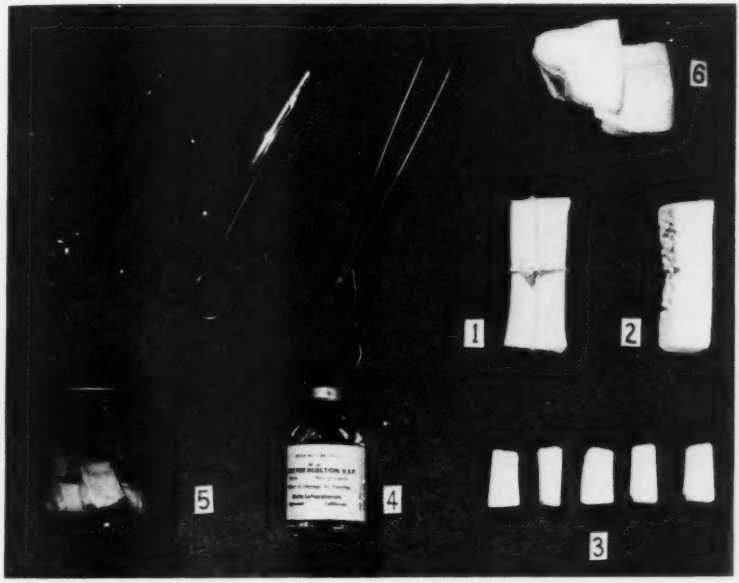

Figure 1. The starch sponge with instruments and materials used in its application: (1) wrapped starch sponge bar, (2) starch sponge bar, (3) starch sponge cut to proper size, (4) sterile water, (5) jar for autoclaving and dispensing, and (6) gauze sponge.

Instruments and materials recommended for inclusion on the surgical tray are a Leur syringe, bottle of sterile normal saline solution, scissors, and spring forceps (fig. 1). The operator cuts the sponge to the proper size and shape and inserts it in the wound. Suturing is facilitated by placement of starch sponge, because bleeding can usually be controlled by absorption of the blood into the interstices of the sponge.

EVALUATION OF EXPERIMENTS

For purposes of evaluation, the patients were divided into two categories: 37 patients with presumably normal bleeding time

(table 1) in whom a starch sponge was employed so that its behavior could be studied and compared with carefully selected controls in the same mouths (table 2); and six patients with abnormal bleeding tendencies in whom starch sponge was used either to prevent or to control hemorrhage.

TABLE 1. *Postoperative observations in starch-treated wounds**

Procedure			Complications		
Method	Type	Number	Post-operative bleeding	Post-operative pain	Osteitis
Experimental (starch)	Tooth extraction (uncomplicated)	71	0	2	1
	Tooth extraction (surgical)	3	0	0	0
	Alveoloplasty	2	0	0	0
	Total	76	0	2	1
	Percent		0	2.7	1.4

*Average bleeding time 1.4 minutes.

The patients in the former group were selected on the basis of their availability for postoperative observation. Their need for additional operations provided adequate controls within the same mouth. The operations included uncomplicated exodontia, tooth extractions, and alveoloplasties. Controls used were identical or nearly identical surgical procedures on the opposite side of the same dental arch in the patient from the starch-treated wound. The operative problems and the anatomy of teeth and investing tissues on either side were relatively similar. For example, upper molars were compared only with upper molars, lower incisors with lower incisors of the opposite side, and so forth. Some patients had only one experimental and one control extraction, while others had several of each. In comparison of alveoloplasties, one side of a treated ridge was compared with the other. Whenever possible, control and experimental operations were performed at the same sitting. The only cases reported are those in which satisfactory controls were available in the same patient. The control site was treated by a standard procedure which usually consisted of holding a plain gauze sponge on the operative site for 30 minutes by biting pressure. The treatment

of the wound in the experimental cases differed only in that a quantity of starch sponge was placed in the tooth socket before closure and placement of the gauze pack.

TABLE 2. *Postoperative observations in control wounds**

Procedure			Complications		
Method	Type	Number	Post-operative bleeding	Post-operative pain	Osteitis
Control	Tooth extraction (uncomplicated)	78	3	3	2
	Tooth extraction (surgical)	3	0	1	0
	Alveoloplasty	2	0	0	0
	Total	83	3	4	2
	Percent		3.6	4.8	2.4

*Average bleeding time 2.0 minutes.

A record for each patient was kept, indicating the identity of the teeth or areas operated on, whether experimental or control, the duration of active bleeding, and the incidence of common postoperative complications.

Bleeding time was determined by removal and replacement of the plain gauze sponge at one-minute intervals until escape of blood from the margins of the socket ceased. The bleeding time in 76 experimental procedures with the starch sponge averaged one and four-tenths minutes, with a range of from one to four minutes. Bleeding time in 83 control procedures in the same patients averaged two minutes, with a range of from one to six minutes. Not a single starch-treated wound showed longer bleeding time when compared with its individual control.

Abnormal postoperative bleeding occurred in three of the 83 control procedures but in none of the 76 starch-treated wounds.

Postoperative pain occurred in two patients treated with the starch sponge and in four patients in whom the control procedure was used. Osteitis followed the treatment of one wound with a starch sponge and two control wounds with standard sponge. This is about the average incidence of this complication at this clinic.

In many cases the starch-containing wound was less inflamed and better healed than the control when seen from two to four days postoperatively. However, the healing sockets in unsutured wounds treated with starch sponges, though not inflamed, appeared deeper than in the controls four to six days postoperatively. Whatever the cause of this phenomenon, the eventual healing occurred in periods of time equal to that of the controls. No foreign-body type reaction was apparent in any of the patients.

VALUE IN HEMORRHAGE CONTROL

The effectiveness of starch sponge in prevention or treatment in six patients with abnormal hemorrhage was studied. Two patients had moderately severe hemorrhage postoperatively from tooth extractions 24 and 48 hours respectively. Bleeding appeared to come from the osseous socket, and pressure alone did not control it. A starch sponge was packed tightly into each socket, over which the tissue was sutured, and the patient was given a gauze sponge to bite on. No further bleeding was noted.

A third patient required removal of seven maxillary teeth and a deeply impacted upper cuspid. During the course of the operation severe bleeding was encountered from vessels along the uncovered palatine portion of the maxillary bone. Pressure failed to control this bleeding, but a starch sponge used in a method similar to that suggested by Rosenfeld[9] did. One end of a starch sponge is immersed in warm normal saline solution and is wiped across the bleeding site. This method is particularly suitable in areas where roughened bone is exposed. The wet starch fills the spaces between the bony irregularities, combining with the blood to form a gelatinous material, and effecting rapid hemostasis.

In another patient with an established diagnosis of thrombocytopenia and a bleeding time of four minutes, a starch sponge was used in conjunction with thrombin after the extraction of three posterior teeth at two sittings. Immediately after each extraction the socket was packed with a starch sponge which had been dipped in freshly prepared thrombin solution. The postoperative course was uneventful.

Two patients gave histories of previous bleeding episodes following exodontia, but no specific cause for such bleeding was evident. As a precaution, a starch sponge with thrombin was used in each patient with normal postoperative course.

SUMMARY AND CONCLUSIONS

Starch sponge is an absorbable hemostatic agent, which is apparently well tolerated by the body, including alveolar bone. The low cost of its manufacture may be of importance in con-

sideration for its further development. Saliva did not hinder its hemostatic action nor did the reaction between starch and saliva produce enough acid to inhibit the action of thrombin solutions.

In relatively uncomplicated exodontia, surgical tooth extractions, and alveoloplasties, starch sponges were convenient to use and did not significantly affect the incidence of postoperative complications, the rate of healing, and bleeding time. In patients with abnormal bleeding of primary and secondary types, starch sponge was effective in controlling hemorrhage.

The use of starch sponge is not considered a substitute for ordinary precautionary measures for the detection of hemorrhagic disease, nor should it take the place of sound surgical principles which, in the presence of normal coagulation processes, will nearly always prevent undue bleeding.

It is believed that starch sponge merits further investigation as a hemostatic agent. This has been in the nature of a preliminary study so far as oral surgery is concerned and its continuance will be directed more toward treatment of patients presenting abnormally profuse or prolonged bleeding, where the field of practical application for substances of this type more truly exists.

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New Institute of Pathology

This is the artist's drawing of the new home of the Armed Forces Institute of Pathology which is rapidly nearing completion on the grounds of the Walter Reed Army Medical Center in Washington, D. C. The building will be ready for occupancy by 1 August 1954, according to present plans.

COLLAGEN TAMPONS AND MEMBRANES USED EXPERIMENTALLY IN DOGS

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PHILIP N. SAWYER, *Lieutenant, MC, USNR*
JAMES W. PATE, *Lieutenant, junior grade, MC, USNR*

A communication indicating that collagen tampons and membranes were being used in Europe as hemostatic and dural-replacement agents, and that reports in the European literature of experimental and clinical trials[1] were essentially favorable, prompted this study in dogs to evaluate the potentialities of such materials.

These products* used were produced under aseptic conditions from the tendons of cows and horses. The isolated fiber has a diameter of about 75 microns, and the membranes are formed by combining fibers to give a thickness of 0.04 to 0.06 mm. The weight of the tampon is about 2.5 to 3 mg./cc.

The project, chosen for investigation of the materials, was outlined as follows:

Phase 1. Hemostasis, employing collagen tampons in dogs, with controls (gelfoam, plain gauze, and no treatment).

Phase 2. Dural replacement, employing collagen membrane in dogs, with controls (fibrin film and no replacement).

Phase 3. Subcutaneous implantation of collagen for evaluation of reaction and absorption, with controls (fibrin film and no treatment).

Further proposed studies, including sterility control, antigenicity, mechanism of hemostasis, and finally, clinical evaluation in the human, were deferred until completion of the first three phases.

From National Naval Medical Center, Bethesda, Md. Lt. Broaddus is now at Passavant Memorial Hospital, Chicago, Ill.

*Procured from Garritano and Paulin, Ziegeleiweg, Berlin, Germany.

METHODS

Phase 1. It was attempted (by applying collagen tampons, gelfoam, and plain gauze to similar bleeding situations in dogs) to determine the efficacy of collagen as a hemostatic agent.

TABLE 1. *Splenic bleeding**

Agent	Number of determinations	Mean bleeding time
Collagen	20	75 seconds
Gelfoam	20	24 seconds
Untreated	10	102 seconds

*1.5- by 1.5- by 0.5-cm. plugs excised. Digital pressure over hemostatic agent with release and observation every 10 seconds.

TABLE 2. *Splenic bleeding**

Agent	Number of determinations	Mean bleeding time
Collagen	10	200 seconds
Gelfoam	10	80 seconds
Gauze	10	325 seconds
Untreated	8	400 seconds

*Incisions in edge of spleen, 1.5 cm. deep. Hemostatic agent placed in incision; no pressure.

TABLE 3. *Splenic bleeding**

Agent	Number of determinations	Mean bleeding time
Collagen	10	60 seconds
Gelfoam	10	10 seconds
Untreated	5	70 seconds

*Wedges 3 by 0.5 cm. from edge. Digital pressure over hemostatic agent with release and observation at 10-second intervals.

Each animal was anesthetized by injecting nembutal sodium (pentobarbital sodium) intravenously, the abdomen shaved, prepared with tincture of merthiolate, and draped. A left transrectus incision was made. In the first two animals, the spleen was delivered into the wound and experiments on the control of splenic bleeding performed, with the results indicated in tables 1 to 4. Four standard types of splenic wounds were produced. These were:

a. Abrasions of surface produced by a fine-toothed hemostat.
b. Excision of 1.5- by 1.5-cm. square of capsule.
c. Wedge resection.
d. Sharp incision, 1 cm. long and 1 cm. deep.

TABLE 4. *Subcutaneous small vessel bleeding with digital pressure maintained*

Agent	Number of observations	Time for hemostasis
Collagen	3	4+ minutes
Gelfoam	3	30 seconds
Gauze	2	4+ minutes

TABLE 5. *Bleeding from small vessels in rectus abdominis*

Agent	Number of observations	Time for hemostasis
Collagen	3	6+ minutes (unabated, so gelfoam substituted, arresting bleeding in 90 seconds)
Gelfoam	3	90 seconds

TABLE 6. *Bleeding from deep circumflex iliac and inferior mesenteric arteries*

Agent	Number of observations	Time for hemostasis
Collagen	2	No effect
Gelfoam	1	3.5 minutes

In the third dog (tables 4 to 6), control of arterial bleeding was studied. Both the deep iliac circumflex and the inferior mesenteric arteries were transected at a point 1 cm. distal to the aorta. The test substance was simply placed over the bleeding vessel, with minimal digital pressure. For study of small vessel bleeding, transverse sharp 2 cm. incisions were carried down through the skin, subcutaneous tissue, anterior rectus sheath, and 5 mm. of the underlying muscle. The larger arteries and veins were ligated and the test substance placed in the wound.

Phases 2 and 3. These were run on the same animals. Anesthesia and nature of preparation were as discussed above. A right temporal craniotomy was performed under aseptic conditions, with electrocoagulation for control of bleeding. A 1.5 by 2.0 cm. section of dura was then excised and a slightly larger piece of moist collagen membrane tucked smoothly into the defect with its periphery beneath the dural edge. The bone flap was replaced and the wound closed with cotton. A collodion dressing was applied. Identical procedures were employed in control animals, with fibrin film being substituted for the collagen membrane in one group and no agent being used to close the defect in the second.

Omitting two dogs that died at operation, one from hemorrhage and the other from anesthesia, ten dogs underwent dural excision. In four, collagen membrane was used to close the defect, in three fibrin film was used, and the other three were controls.

In four of these dogs transverse 3 cm. incisions were made to the right of the spine in the mid-back, the incisions being made about 5 cm. apart.

The subcutaneous areolar tissue was bluntly dissected with a single swipe of a flexed index finger. Hemostasis was effected with No. 80 cotton ligatures. A 2- by 2-cm. piece of collagen membrane was placed in the anterior wound, a similar piece of fibrin film in the middle wound, and nothing in the posterior wound. Each wound was closed with No. 50 cotton and collodion was applied.

RESULTS

Phase 1. The results are shown in tables 1 through 6. The controls were satisfactory, *i. e.*: the untreated areas all had essentially the same bleeding times, far longer than the treated areas. It is seen in tables 1, 2, and 3 that collagen is much less effective against bleeding splenic wounds than is gelfoam. On splenic abrasions, gelfoam, collagen, and plain gauze are all effective. Collagen is slippery and difficult to handle with no tendency to adhere, swell, or produce tamponade.

For small vessel or arterial bleeding (tables 4, 5, and 6), collagen seems completely ineffectual.

Phase 2. The results are included in table 7, where it is seen that fibroblastic and inflammatory responses were maximal for collagen and minimal for fibrin. In the two dogs in which collagen membrane was used and that were autopsied after 20 days, the collagen had been completely replaced, but there was a fibroblastic and inflammatory mass uniting the brain with the replaced bone flap. This was also noted in the one dog with no dural substitute that was posted at 21 days. The one dog in which fibrin film was employed and that was allowed to live beyond 20 days

TABLE 7. *Dural replacement*

Dog	Replacement agent	Infiltration of brain	Subarachnoid fibroblastic activity	Subarachnoid inflammatory cell response	Condition of graft	Fibroblastic activity outside graft	Inflammatory cell response outside graft	Glioblastosis	Clinical course and findings
1	Collagen	0	4+	3+	fragmented	3+	4+	1 - 2+	Comatose; sacrificed 7th day; purulent meningitis.
2	Collagen	2	3	3	early dissolution	3	3	2	Sacrificed 8th day; adhesions, brain to skull.
3	Collagen	2	3	3	gone	3	3	1	Sacrificed 23d day; adherent mass between brain and skull.
4	Collagen	1	3	3	gone	3	3	1	Sacrificed 29th day; adherent mass between brain and skull.
5	Fibrin	0	1	1	unchanged	1	1	1	Sacrificed 8th day; no adhesions.
6	Fibrin	0	1	1	early dissolution	2	0	0	Sacrificed 22d day; no adhesions.
7	Fibrin	Dog lost							
8	None	0	0	0				0	Died after 1 day; herniated brain.

TABLE 7. *Dural replacement*—Continued

Dog	Replacement agent	Infiltration of brain	Subarachnoid fibroblastic activity	Subarachnoid inflammatory cell response	Condition of graft	Fibroblastic activity outside graft	Inflammatory cell response outside graft	Gliomblastosis	Clinical course and findings
9	None	0	2	3				2	Sacrificed 10th day; local meningitis.
10	None	1	2	2				1	Sacrificed 21st day; adherent mass between brain and skull.

(posted at 22 days) still had a relatively intact piece of fibrin in the dural defect, and there was no attachment of brain to skull or even of brain to fibrin.

Fibrin caused little reaction and was very slowly replaced. Collagen evoked marked reaction and was replaced in about 20 days. The reaction persisted and united the bone flap and brain with scar tissue. The scar tissue formation in the dogs in which no replacement agent was used paralleled that noted in the dogs in which collagen membrane was used. One dog in which no agent was used died of cerebral herniation through the dural defect. This occurred in none of the dogs in which fibrin or collagen was employed. It was noted that collagen membrane, when moistened prior to insertion, was convenient to work with, resembling dura in consistency and flexibility. Fibrin film was slippery and less pliable.

TABLE 8. *Subcutaneous implantation*

Dog	Agent employed	Replacement of graft	Fibroblastic reaction	Inflammatory cell reaction
1	Collagen	3/4	4+	4+
2	Collagen	Traces remain	4	4
5	Collagen	Almost complete	4	4
10	Collagen	Complete	4	4
1	Fibrin	None	0	0
2	Fibrin	None	3	3
5	Fibrin	None	1	1
10	Fibrin	Slight	0	0
1	Nothing		0	0
2	Nothing		3	3
5	Nothing		2	1
10	Nothing		0	0

Phase 3. The results of subcutaneous implantation are shown in table 8. At the time the dogs were autopsied, wedges were excised to include the areas of collagen, fibrin, and control wounds. All wounds were clinically free from infection and hemorrhage. Results were expressed as objective evaluation of microscopic sections (figs. 1 and 2) stained with hematoxylin and eosin.

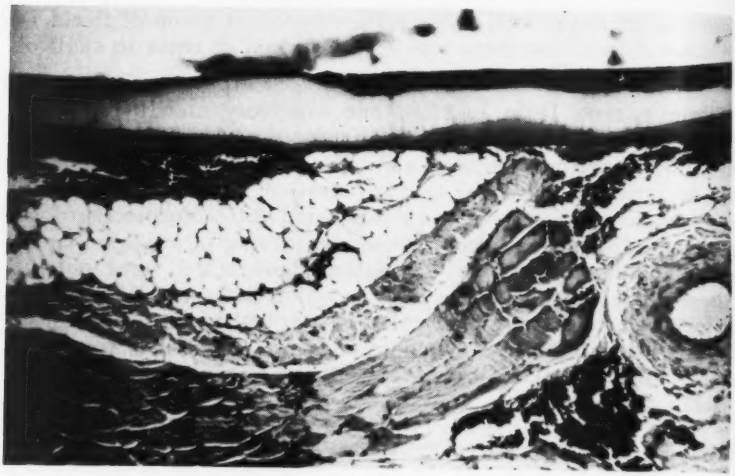

Figure 1. Subcutaneous tissue into which fibrin film was placed eight days previously. There is a minimal fibroblastic and inflammatory response and the fibrin film is relatively intact.

Collagen caused marked inflammatory and fibroblastic response in the surrounding tissues. It was replaced in 20 days, but the reaction persisted. Fibrin evoked no more response than that ob-

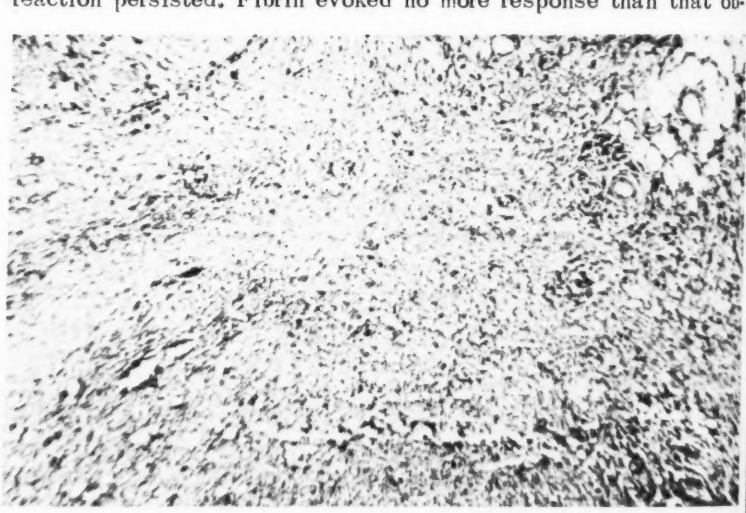

Figure 2. Subcutaneous tissue into which collagen membrane was placed eight days previously. There is severe inflammatory and fibroblastic response and the collagen membrane is fragmented and almost completely absorbed.

served with the same amount of dissection when no material was used in the wound. The fibrin showed only slight absorption in 20 days.

CONCLUSIONS

Collagen tampons were compared with gelfoam and ordinary gauze as a hemostatic agent for venous and arterial bleeding. It was found that collagen was inferior in adhesive qualities, would not expand to offer effective tamponade, and was inferior even when these failings were corrected by the exertion of steady pressure. It was approximately one fifth to one third as effective against splenic bleeding or ooze as gelfoam, and showed no tendency to arrest major arterial or small vessel bleeding.

Collagen membrane (unlike collagen tampon in hemostatic tests) was easy to use, resembling the normal dura. It does not seem acceptable for dural substitution, however, because of its rapid resorption (20 days) and the marked inflammatory and fibrous tissue response which it evokes. After resorption of the collagen, there is a scar uniting the brain and overlying bone. This is indistinguishable from the scar noted after 20 days when no dural agent is employed and the dural defect is merely left open.

Collagen after subcutaneous implantation was completely digested in 20 days. There was, again, associated inflammatory and fibroblastic reaction.

It is recognized that the number of animals used in each phase of this experiment is small. Because of uniformly unfavorable results obtained, however, it is believed that further experimental and clinical evaluation of this material is not indicated.

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Caudal Anesthesia

The resident house staff of St. Louis Maternity Hospital conducted 5,000 continuous caudal anesthetics over a seven-year period. In 81.5 percent of the patients, the results were entirely satisfactory. Partial success was obtained in 5 percent. Failures occurred in 13.5 percent.

—ALBERT GOLDHAR, M. D., and
WILLIAM H. MASTERS, M. D.
in *Mississippi Valley Medical Journal*, p. 124, Sept. 1953

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VENTILATION AND OXYGEN ABSORPTION IN THYROIDISM

An Analysis of Respiratory Tracings

JAMES C. SYNER, *Captain, MC, USA*

THE respiratory tracing from which the basal metabolic rate is determined is seldom, if ever, inspected or analyzed by physicians. If these tracings were inspected, they would be of great value in obtaining information on pulmonary ventilation in thyroid dysfunction as well as in evaluating the state of the patient during the metabolism test. Apprehension, anxiety, and discomfort will appear as a grossly irregular tidal exchange, producing a variable oxygen uptake, sighing respirations, and a variation in the respiratory rate. The calculation of the tidal volume, respiratory rate, and minute volume will provide information of ventilatory activity relative to oxygen consumption.

In an analysis of 75 random basal metabolism tests at this hospital, these were inspected for evidence of air leaks in the system, stigmas of pulmonary dysfunction, and appraisal of the patient's state (steady, variable, apprehensive, relaxed, et cetera). In addition to oxygen consumption, the tidal exchange, respiratory rate, minute volume, and ventilation equivalent of oxygen were determined. The procedure in calculating these values has been adequately covered in other sources.[1-7] Briefly, the ventilation equivalent of oxygen expresses the efficiency of oxygen absorption relative to the volume of pulmonary ventilation, and indicates that for every 100 cc. of oxygen absorbed, "x" liters of gas were ventilated.

The ventilation equivalent of oxygen is important in the detection and study of factors involved in hyperventilation. Hyperventilation is a physiologic alteration present in many disease states. A variety of factors are involved in its production. It occurs in pulmonary disease with associated ventilatory dysfunction, distribution-diffusion impairment, lowered arterial oxygen tension, and altered pulmonary reflex mechanisms in fibrosis. It is present in cardiovascular-pulmonary disease in which there is impairment in pulmonary blood flow and in states of fear, anxiety, and pain. It has also been reported in hyper-

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thyroidism,[8] a finding not substantiated by this study or by Puppel and Wrobel.[9] Conventionally, hyperventilation is regarded as being present when a rapid respiratory rate is combined with an apparently shallow movement. The increased pulmonary ventilation relative to oxygen absorption is usually not considered. Only by the direct measurement of ventilatory volume and oxygen absorption from the respired air is this relationship shown. The concept of hyperventilation is suggested as a state in which a large amount of air is ventilated with the associated low oxygen absorption expressed quantitatively as a high ventilation equivalent of oxygen. A patient with a respiratory rate of 25 per minute and tidal exchange of 450 cc. (minute volume, 11.3 liters per minute) may appear to be hyperventilating. With an oxygen uptake of 380 cc. per minute, however, a high normal ventilation equivalent of oxygen (2.96) is obtained. Therefore, in meeting a particular oxygen need the patient is not hyperventilating. A patient with a comparable minute volume and oxygen consumption of 250 cc. per minute has a ventilation equivalent of oxygen of 4.5 which is a considerable elevation above the normal. In meeting that particular oxygen need the patient is hyperventilating.

TABLE 1. *Ventilation equivalent of oxygen for various conditions*

Condition	Number of patients	Number of observations	Mean ventilation equivalents of oxygen	Extremes ventilation equivalents of oxygen
Hyperthyroidism	8	20	1.95	1.7 -2.14
Hypothyroidism	6	14	5.85	3.89-13.1
Chronic anxiety	4	12	3.44	2.35-6.12
Normal	57	71	2.46	2.23-2.75

In this study a significant difference in the pulmonary ventilation equivalent of oxygen was noted between the hyperthyroid and hypothyroid patients (table 1). Patients with hyperthyroidism absorbed a much larger quantity of oxygen from a given amount of respired oxygen than did normal patients. This is expressed quantitatively in the low mean ventilation equivalent of oxygen (1.95). Patients with hypothyroidism absorbed a much smaller quantity of oxygen from a given amount of respired oxygen than did the normal patients. This is expressed quantitatively in the high mean ventilation equivalent of oxygen (5.85). This mean was influenced by one patient (case 3, table 2) with hypothyroid-

TABLE 2. *Correlation of the ventilation equivalent of oxygen with other studies in various metabolic states*

Case	Basal metabolic rate	Oxygen consumption (cc. per min.)	Minute volume (liters per min.)	Ventilation equivalent of oxygen	M. B. C.* (liters per min.)	I-131 (percent uptake)	Cholesterol (mg. per 100 cc.)	Clinical diagnosis
1	+17	280	5.3	1.9	110	67	177	Hyperthyroidism
	+29	295	5.0	1.7	112	67	159	
2	+14	395	8.45	2.14	122	76	179	Hyperthyroidism
	+43	370	7.7	2.08	118	76	163	
			One month after 400 mg. propylthiouracil daily					
	−5	250	8.52	3.41			212	
3	+ 2	250	22.7	9.0	140	10	395	Hypothyroidism
	−10	223	30.3	13.1	136	10	389	
4	−18	240	12.5	5.2	145	16	266	Hypothyroidism
	−22	236	13.2	5.6	142	16	255	
5	+14	295	11.1	3.76	155	35	198	Chronic anxiety state
	+43	379	12.7	3.35	151	35	204	

*Maximal breathing capacity.

ism secondary to pituitary chromophobe adenoma and associated increased intracranial pressure. The degree of extreme hyperventilation (minute volume, 22.7 to 30.3) which was due to the increased intracranial pressure is speculative because follow-up studies were not available. There is usually slow, stertorous breathing, however, in patients with increased intracranial pressure.[10]

This study suggests that oxygen absorption is so efficient in uncomplicated hyperthyroidism that such patients can hypoventilate and still meet the increased demands of the hypermetabolic state. In contrast, the patient with hypothyroidism may need to hyperventilate to meet the oxygen needs of a less demanding state. The data in table 2 suggest that the ventilation equivalent of oxygen often correlates better with the metabolic state than does the calculated basal metabolic rate. This calculation can be of value in the interpretation of the measured basal metabolic rate. When correlated with clinical data and associated laboratory results, it provides the clinician with a further diagnostic tool for appraising the validity of the measured basal metabolic rate as reflecting a state of thyroid dysfunction or extrathyroid influences. In respect to this latter problem, the value of careful inspection of the character of the respiratory tracing cannot be overemphasized.

Weymouth and Brice,[8] from an analysis of basal metabolism records, concluded that in both hypothyroidism and hyperthyroidism there was overventilation with a fall in the volume of oxygen absorbed per tidal breath. They expressed this as the coefficient of ventilation (CV) and defined it as the volume percent removed as oxygen from the tidal volume. Their observations agree with this study on hypothyroidism but not on hyperthyroidism.

Puppel and Wrobel reported an increased efficiency of absorption of respired oxygen by patients with hyperthyroidism. They found that patients with hyperthyroidism absorbed a much larger quantity of oxygen from a given amount of respired oxygen than did normal people. They found that patients with extrathyroid causes of hypermetabolism had a near normal coefficient of absorption. In their experience adequate medical or surgical therapy returned the absorption to normal. These findings agree with the data reported in this paper. Puppel and Wrobel made no mention of studies on hypothyroid patients.

In concluding that overventilation was characteristic of both hypo- and hyperthyroid states, Weymouth and Brice postulated that both an excess and a deficiency of the thyroid secretion increased the sensitivity of the respiratory center. That either the absence or the presence of a given stimulus may produce the

same effect does not seem reasonable. If it is logical to assume that excess thyroid substance stimulates the respiratory center to produce a characteristic ventilatory response, then its absence should result in a contrasting ventilatory pattern. Contrasting ventilatory patterns should be found in these different disease states.

In concluding that hypoventilation with increased efficiency of absorption of respired oxygen was characteristic of hyperthyroidism, Puppel and Wrobel postulated that a great increase in minute volume of blood flow through the lung was largely responsible. My own findings, as well as those of Puppel and Wrobel that increased efficiency of oxygen absorption in hyperthyroidism and decreased efficiency of oxygen absorption in hypothyroidism, are consistent with such a mechanism. Actually there are two fundamental ways by which a greater demand of the tissues for oxygen may be met: (1) by increasing the total blood flow through the tissue and (2) by increasing the coefficient of oxygen absorption by establishing a steep oxygen pressure gradient between the arterial blood and alveolar sac on the one hand and the venous blood on the other. The extent to which each operates is both variable and speculative.

SUMMARY

In calculating the ventilation equivalent of oxygen from the respiratory tracing of a basal metabolic test, a further diagnostic tool may be obtained for appraising the validity of the basal metabolic rate as reflecting a state of thyroid dysfunction or extrathyroid influences. In this study a significant difference in this value was noted between patients with hyperthyroidism and those with hypothyroidism. The former absorbed a much larger quantity of oxygen from a given amount of respired oxygen than did normal persons. The patients with hypothyroidism absorbed a much smaller quantity of oxygen from a given amount of respired oxygen than did normal patients.

Inspection of the respiratory tracing will aid in evaluating the state of the patient during the procedure. Calculation of tidal volume, respiratory rate, and minute volume will provide information of ventilatory activity which can serve as a means of detecting conditions of pulmonary insufficiency. Because of the rather wide variability in the ventilation equivalent of oxygen, this pattern may fail to show in some individual observations.

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Surgery as an Applied Science

In a sense, the whole history of surgery over the past few centuries has been one of transition from empirical to scientific approaches. Paré, as early as the sixteenth century, made good use of current advances in anatomy. But the transition accelerated with progress in fields related to surgery, and constantly enhanced the prestige of surgeons themselves. Thus John Hunter, who is said to have made English surgeons over into gentlemen, was a great anatomist and anthropologist as well as an outstanding surgeon, and each of his interests benefited from the others. Again, dupuytren, the celebrated surgeon of the *Hotel Dieu* in Paris (1777-1835), emphasized the importance of pathologic anatomy as a basis for surgery. In the later nineteenth century, it became of the greatest value for the surgeon to know physiology as well as anatomy. Physiology opened new possibilities to surgery, and the men who exploited these attained fame as pioneers. One need recall, in this country, only such instances as are afforded by Halsted's work on the care of tissues, Cushing's on endocrinology and brain surgery, and Crile's on surgical shock. Today all able surgeons are workers in applied science, and some conduct basic research as well.

—RICHARD H. SHRYOCK, Ph. D.
in *Journal of the International College of Surgeons*, p. 513, Oct. 1953

NEVOCARCINOMA

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EXPERIENCE indicates that consideration of nevocarcinoma is likely to incite controversy which might be resolved if the opponents possessed both histologic and clinical knowledge of pigmented tumors of the skin. It is the purpose of this report to present a dermatologic concept of the condition and a philosophy concerning its treatment.

Nevocarcinoma is the most accurate term for a tumor synonymously designated as malignant melanoma or, more crudely, as melanoma. Literally, nevocarcinoma means a malignant epithelial tumor arising from a nevus. Because the majority of authorities agree that nevocarcinoma evolves only from the junction nevus, this term portrays exactly the type of tumor and its genesis. Melanocarcinoma, literally a black malignant epithelial tumor, is an acceptable though less precise definition. The use of malignant melanoma only embroiders the confusion, since its literal meaning, a malignant black tumor, embraces such diverse entities as pigmented basal cell epithelioma, Kaposi's hemorrhagic sarcoma, and lymphoblastoma. The term melanoma, literally a black tumor, applies equally to such benign conditions as seborrheic wart, nodulus cutaneous, and pyogenic granuloma. It is absurd to use the term amelanotic melanoma, literally a nonblack black tumor.

Although the voluminous literature on the subject does not clearly indicate it, this is a rare disease. Shaw[1] recently polled 201 dermatologists, averaging 20 years of practice in the specialty, and found that in approximately 1,625,000 nevi treated, malignancy was encountered 29 times, or in 1.78 cases per hundred thousand. Considering that nearly all persons have one or more pigmented nevi, this figure can be related to MacDonald's[2] report of 1.8 cases per hundred thousand population in Connecticut for a 12-year period.

What are the criteria for the diagnosis? It should be stated at the outset that there are no early definite features, either clinically or histologically, which will invariably distinguish the

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condition. The presence of metastases, which sometimes will be discovered before the primary site, of course determine the cancerous state.

CLINICAL CONSIDERATIONS

Nevocarcinoma is to be considered in the differential diagnosis of all pigmented tumors of the skin, and uncommonly will present itself nonpigmented. Only infrequently will there be any difficulty for the experienced clinician in correctly identifying verruca vulgaris and seborrheic warts, the smooth sessile fibroma durum, the soft, friable, and readily hemorrhagic pyogenic granuloma, the soft elastic, and often vermiform hemangioma, the abruptly bordered and usually crusted basal cell epithelioma, and the usually multiple, firm, and nodular Kaposi's sarcoma.

The knowledge of the areas of predilection of the various tumors is as helpful to the clinician as is the recognition of dyskeratotic phenomena to the histopathologist. When it comes to pigmented nevi, however, the examiner treads on unfirm ground. Generally it can be said that the common pigmented "mole" of the layman, is an elevated, uniformly tan to dark brown, uneven and soft nodule, frequently hairy. Several to many are present in the same individual and the numbers are prone to increase at puberty. This is the nevus histologically denominated as the cellular, intradermic type, and is invariably benign. However, the junction type nevus and nevocarcinoma can simulate this clinical picture. Conversely, when the intradermic nevus develops folliculitis and becomes exuberant with an inflammatory pyodermic response, it is easily mistaken for nevocarcinoma.

This situation has led some histopathologists to decry the reliability of clinical diagnosis in general, but they should remember that most of them are not experienced clinicians, and that an occasional error by the latter does not negate their whole science. In this respect a critical appraisal of histopathologic diagnosis reveals many weaknesses; among them, the accurate differentiation of some senile keratoses from prickle cell epithelioma, of simple fibroma durum from fibrosarcoma, and of junction nevus from nevocarcinoma. Considering that the histopathologist deals with dead tissue distorted by fixatives, and must depend on the size, shape, and staining reaction of cells composing it, it would be surprising if he had no difficulty in relating his findings to living tissue.

The junction type nevus, on the average, is flat and macular, uniformly tan to irregularly black in color, palpably indistinguishable from the surrounding skin, and hairless. It differs histo-

logically from the intradermic variety by revealing the characteristic epidermo-dermal proliferation of melanogenocytes, also called dendritic or clear cells. At puberty, junction nevi frequently enlarge and elevate, irregularly increase their pigmentation, and if first seen then may be mistaken for the intradermic type. Such a change is physiologic far more often than it is malignant. Other junction nevi, however, said by the patient to have been unchanged throughout life, apparently are of the clinical intradermic type from the beginning. The giant nevi, often having a bathing trunk distribution or involving the junction of an extremity with the trunk, are verrucous, irregularly pigmented, and may contain nodules and hair. They are a clinical variant of the junction type, and are prone to malignancy.

The blue nevus of Jadassohn-Tièche is the third of the cellular types. Clinically it has a blue or slate-gray color because it is situated in the mid or lower corium, the overlying normal skin filtering out part of the color, just as it does with veins. Because of its position, it is macular or only slightly nodular. It is usually solitary, but the Mongolian spot which is histologically identical may be multiple as are related lesions found infrequently on the cheeks. Most authorities label this a benign growth, though there are sparse and questionable reports of malignant blue nevus. Traub and Keil,[3] quoting the supporting opinions of others, stated that they have never seen a malignant growth develop from such a lesion.

Considering the foregoing clinical pitfalls, the best practice is to take a specimen for biopsy from questionable lesions. There is a hesitancy on the part of many physicians to employ this procedure, fearing extension of an already malignant process, or transformation to malignancy. Becker[4] observed, however, that biopsy actually interferes with possible spread, the subsequent inflammatory reaction sealing the local lymphatic channels for a short period, and Sachs and associates[5] stated that they have never seen malignant transformation follow biopsy, nor increase the degree of existing malignancy.

HISTOLOGIC CONSIDERATIONS

It has been stated above that there were no invariably reliable histologic findings for the diagnosis of nevocarcinoma, and at the same time histologic examination was recommended for questionable lesions. These statements are reconciled by the fact that the histologic structure will differ sharply in the pigmented lesions which arise from cellular nevi and in those which do not. The benign intradermic and blue nevi can thus be distinguished from the junctional type, and the inflamed pyodermic intradermic nevus from nevocarcinoma, but when it comes to the

question of junction nevus versus nevocarcinoma, the pathologist also treads on unfirm ground. Many of them will disagree with this statement, clinging to histologic criteria of malignancy which have proved to be reliable in other cancerous conditions, but which clinical evidence repeatedly indicates are of questionable application to nevocarcinoma. Thus Allen and Spitz[6] stated, "In those restive junctional nevi, in which anaplastic and certain qualitative cellular changes have occurred, the odds are enormous that this *altered* junctional nevus, if allowed to remain, in time would evolve into a melanocarcinoma." In contrast, Lund and Stobbe[7] stated, "junctional proliferation in nevi of adults does not in itself indicate melanoblastoma." Wise[8] in a discussion of Traub and Keil[3] stated, "In many instances of this type the clinical diagnosis seems to have more weight than the microscopic." It is the inferential application of histologic data to clinical course which is greatly responsible for the existing confusion concerning the diagnosis and treatment of nevocarcinoma.

Consideration of juvenile melanoma emphasizes the impossibility of unequivocal distinction between junction nevus and nevocarcinoma. Named because it was thought originally to occur only before the age of puberty, juvenile melanoma occupied a special niche, being histologically indistinguishable from adult nevocarcinoma and yet having *clinical* behavior that was very rarely malignant. Spitz's[9] study of this entity delineated a special cytologic feature of some benign lesions, namely, the presence of a large mononuclear or multinucleated cell having an acidophilic cytoplasm, sometimes granular, but seldom containing pigment. This cell was "argentophobic," and while myomatous in appearance was not of muscle origin tinctorially.

While most tumors of this type were in children below the age of 12, Spitz found one in a 19 year old, and Allen and Spitz[6] reported one in a patient of 42. Spitz found other tumors in children, however, that were histologically undifferentiated from adult nevocarcinoma, not of this special cell type, and which also behaved in a benign manner. They were composed of cells irregularly enlarged, with vesicular nuclei which were sometimes duplicated, and were without prickles, even when situated in the epidermis. Often islands of these large pigmented cells extended down into the dermis and were accompanied by a constant but variable degree of inflammatory reaction and edema. Mitotic figures usually could be found without difficulty. Depending upon what author is consulted, some or all of these findings of variation in size of the individual cells, multiplication of nuclei, loss of prickles, invasion of the cutis, inflammatory response to that invasion, and the presence of mitotic figures, will be considered

as evidence of malignancy. Yet to repeat, lesions so characterized behave in a benign manner in children. Recalling that the juvenile melanoma of Spitz's specific cell type is now known to be benign, even in adults, does it not seem more than likely that other as yet unclassified cell types may persist into adult life and also behave benignly? Allen and Spitz[6] answer this in their discussion of juvenile melanoma. They included both pre- and post-pubertal lesions under this title, applying it to any lesion in which *clinical* benignity controverts the histologic malignancy. Although among the leading proponents of the histologic diagnosis of nevocarcinoma, they were able on histologic grounds alone to determine benignity in only two thirds of the cases. To state this in another way, one out of every three patients demonstrated clinically to have had a benign lesion, on histologic grounds alone could have become a candidate for radical surgery. Consider with what greater frequency this must have happened where the histopathologist failed to accord to the clinical evidence the weight it deserves. Masson,[10] who has spent a lifetime studying nevi and nevocarcinoma, says of the relationship between them, "We should possess some very accurate and safe histologic criteria for malignancy; we have none at present."

A method has now become available, however, which gives great promise of solving the problem. Lerner and associates[11] demonstrated the presence of tyrosinase in human skin and, at least experimentally, determined that it and not Bloch's dopa oxydase was responsible for the conversion of tyrosine into melanin. Fitzpatrick,[12] employing first the histochemical method of detecting tyrosinase and later the biochemical method of oxygen uptake, showed that unirradiated normal skin was negative for tyrosinase activity, as was the intradermic cellular nevus. The junction nevus was negative to weakly positive, but nevocarcinoma, both pigmented and unpigmented, was strongly positive. Other conditions such as prickle cell epithelioma, pigmented basal cell epithelioma, verruca senilis, lentigo, and ephelides all failed to give the tyrosinase reaction. If such a pattern continues to be elicited, then indeed will nevocarcinoma be invariably distinguished.

TREATMENT

Treatment is no less controversial than the establishment of the diagnosis. Inability to establish an unquestioned diagnosis has invalidated many statistics, and the confusion is compounded by an apparently variable and unpredictable degree of malignancy in this tumor. Undoubtedly tumors of low malignancy have been cured by coagulation when mistakenly treated as pigmented nevi, while others are never cured regardless of the measures used.

Allen and Spitz's[6] well-documented study reveals that of 123 patients surviving five years or longer, 84 received only local excision. The remaining 39 had additional node dissection. Of these, 14 had local recurrences yet survived re-excision five years or longer. A low degree of malignancy may have accounted for this large number of survivals. The high end of the scale is ably presented in Pack and associates'[13] oft-quoted study; 552 of their 862 patients had recurrent lesions, having received prior treatment elsewhere. Their best results were obtained by wide and deep excision of the primary lesion (at least 6 to 10 cm. of skin border, and a still wider circle of deep fascia), of the lymphatic drainage of the primary site (that is, a strip of skin between it and the regional nodes), and of the first group of regional nodes, all of this en masse. Where the primary site was at a great distance from the nodes, as in hand or foot, radical amputation was performed. Despite this determined attack, their results were far less favorable than in Allen and Spitz's series noted above, being 17.7 percent five-year survival for localized melanoma (Pack's term), and 15.6 percent for metastatic melanoma. That this extreme procedure did not give a preponderance of cures probably resulted from the fact that only the lymphatic route of metastasis thereby was interrupted. The vascular route often is utilized by nevocarcinoma, and this may be the explanation of an apparent degree of malignancy. Cure or death may depend on the chance erosion of the tumor into a blood vessel, because once it enters the circulation it has escaped beyond the scope of present-day therapeutic measures.

The conservative philosophy of the treatment of primary nevocarcinoma considers the ever-present possibility of an error in diagnosis, the chance that vascular metastases are hidden internally, and weighed against these, the permissible degree of disability ensuing from treatment. The radical philosophy disregards the question of diagnosis, shifting this responsibility to others; shrugs off the possibility of vascular metastases as therapeutically insoluble; and aims its major effort at lymphatic metastases. No degree of ensuing disability is considered limiting, the basic premise being that the saving of a life justifies critical sacrifices of tissue. When all facets of the problem receive equal weight, it is apparent that some degree of calculated risk must accompany any form of treatment. An attack based only on local excision of the primary site does no great harm to the patient, even if the diagnosis has been wrong; it does not disable for the remainder of life should vascular metastasis have preceded treatment; and it conserves comparatively large amounts of tissue, including whole extremities, at the risk of not encompassing lymphatic metastasis. Its total risk therefore is far less than that of the radical so-called "prophylactic" procedures.

There are indications that the solution of the problem of nevocarcinoma may be gained through chemotherapy. For years the halo nevus has been a dermatologic curiosity. It is so designated because of the halo of depigmentation surrounding the central nevus. Leider and Fisher,[14] after long observation of such lesions, pointed out that eventually the nevus entirely disappears, not even leaving a histologic trace. The loss of the ability to produce pigment, in some way, destroys the nevus. Coupling this observation with the discovery that only nevocarcinoma possesses an active enzyme system for producing pigment, it seems likely that an inhibitor of that enzyme might be a potent therapeutic agent, perhaps able to attack the metastases as well as the primary lesion.

SUMMARY

Nevocarcinoma is the precise term for this rare disease. There are no invariably reliable histologic or clinical criteria for the establishment of this diagnosis. In view of the ever-present possibility of an error in diagnosis and the chance that vascular metastases may have occurred, treatment should be conservative.

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POTASSIUM IN THE TREATMENT OF CARDIAC ARRHYTHMIAS DUE TO DIGITALIS INTOXICATION

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CARDIAC arrhythmia during digitalis intoxication is potentially serious. In many cases the rhythm will spontaneously revert to normal after withdrawal of digitalis. In some patients, however, the arrhythmia may persist, especially in those in whom the more slowly excreted preparations such as digitalis leaf or digitoxin have been used. This causes an increased strain on an already diseased heart, particularly if ventricular tachycardia develops. Active measures must be taken to obtain a normal sinus rhythm if myocardial exhaustion, increased congestive failure, and even death are to be prevented.

Administration of potassium salts has been reported to be effective in the rapid re-establishment of normal sinus rhythm in cases of arrhythmia due to digitalis intoxication.[1-3] It apparently was a lifesaving factor in a patient treated at this hospital.

CASE REPORT

A 42-year-old woman was admitted to this hospital on 22 December 1952 complaining of nausea, vomiting, and weakness. In the fall of 1950 she had noted the onset of progressive dyspnea, orthopnea, and ankle edema, however, she did not seek medical attention until November 1951. Because of rheumatic heart disease, manifested by mitral insufficiency and stenosis with increased pulmonary artery pressure, she was placed on a low sodium diet and given ammonium chloride, digitalis leaf (0.1 gram daily), and frequent injections of mercaptomerin sodium (thiomerin). On 20 December 1952, following an injection of 2 cc. of mercaptomerin sodium, marked diuresis occurred for 24 hours and the patient developed a general feeling of increasing weakness, followed by nausea and vomiting, for which she was admitted to the hospital.

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When first examined she was acutely ill, lethargic, and frequently vomited small amounts of clear green liquid. Her blood pressure was 112/65. Her pulse was regular with frequent premature contractions and the rate was 95 to 100 per minute. Her heart was moderately enlarged and a harsh, grade III systolic murmur with a questionable diastolic component was heard best at the apex. The first mitral sound was loud and snapping, and the second pulmonic sound increased in intensity.

TABLE 1.

Date	Serum mEq./L.		Urine specimens		
	Sodium	Potassium	Hours	mEq. of sodium ion	mEq. of potassium ion
22 Dec 1952	135	3.5	12	75	95
23 Dec 1952	140	5.3			
25 Dec 1952			24	40	27.5

Laboratory study findings revealed the following: blood urea nitrogen, 17 mg. per 100 cc.; carbon dioxide combining power, 26 mEq./L.; blood chlorides, 96 mEq./L. The urinalysis showed a one plus albumin. The sodium and potassium levels of the urine and blood serum are recorded in table 1. A roentgenogram of the chest showed generalized cardiac enlargement, especially of the left atrium and pulmonary artery segments, and slight pulmonary congestion. An electrocardiogram on admission showed atrial tachycardia with a 2:1 atrioventricular block (fig. 1A).

Because of the suspected diagnosis of low sodium syndrome and digitalis intoxication, digitalis was withheld and, after blood samples had been obtained for study, the patient was given 100 mg. of pentobarbital sodium (nembutal) intramuscularly and 1,000 cc. of 0.9 percent sodium chloride intravenously. The serum sodium level (table 1) failed to confirm the initial impression of sodium depletion. With treatment, however, the patient improved; vomiting stopped, and she slept for several hours. The arrhythmia persisted at a slower rate until about eight hours after admission when bigeminal rhythm developed superimposed on the atrial tachycardia with a 2:1 A-V block (fig. 1B). This was soon replaced by a nodal tachycardia, followed by a return to atrial tachycardia with 2:1 A-V block and frequent multifocal extrasystoles (fig. 1C). The patient began to vomit again and it was believed that ventricular tachycardia might develop if reversion to normal sinus rhythm was not accomplished.

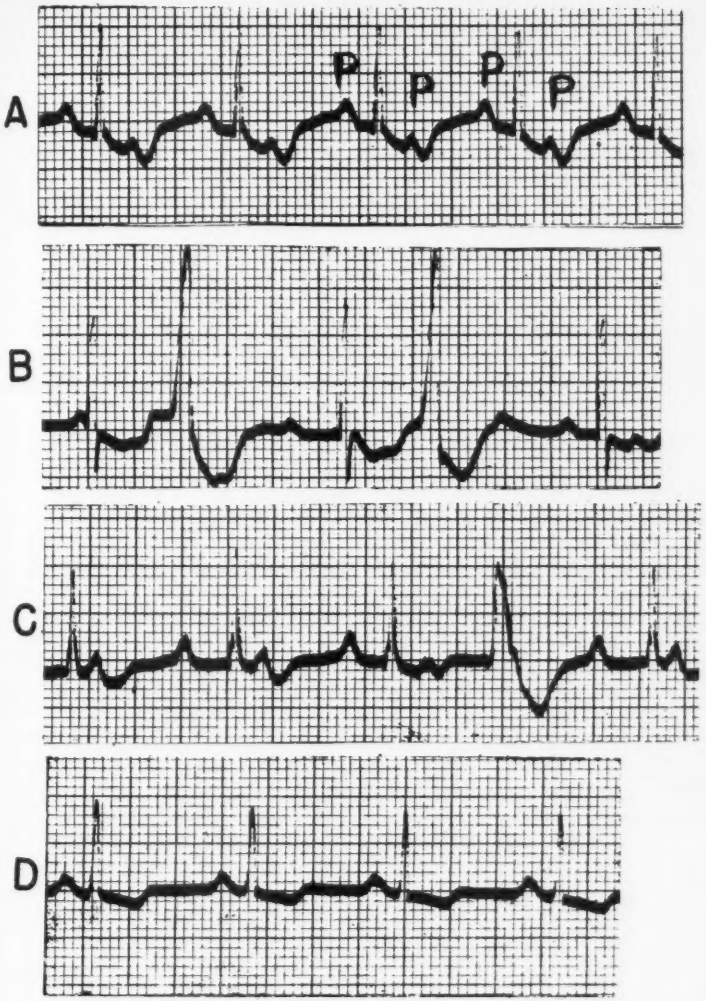

Figure 1. Electrocardiograms taken 23 December 1952 prior to and after treatment of patient with potassium. (A) *Atrial tachycardia with a 2:1 atrioventricular block.* (B) *Bigeminal rhythm superimposed on the atrial tachycardia with a 2:1 A-V block.* (C) *Atrial tachycardia with a 2:1 A-V block and an extrasystole.* (D) *Normal sinus rhythm 15 minutes after a second dose of potassium chloride.*

The patient was given 0.9 gram of potassium chloride orally in enteric-coated capsules. One hour later the dose was repeated.

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Fifteen minutes after the second dose of potassium chloride, the cardiac rhythm reverted to a normal sinus mechanism (fig. 1D). During the next 10 days, 0.3 gram of potassium chloride was given three times daily and normal sinus rhythm was maintained. At the end of 10 days, potassium chloride was discontinued because of gradually increasing dyspnea, orthopnea, and weight gain, and the patient was redigitalized with digoxin. Abnormal rhythm did not recur and the patient was discharged from the hospital.

DISCUSSION

Lown and his associates[2,3] have pointed out that a decrease in the intracellular potassium may result in increased sensitivity of the heart muscle to digitalis, and that excessive loss of potassium during diuresis may result in digitalis intoxication in patients on a maintenance dose. The administration of potassium chloride allows reversal of the process of cellular depletion, thereby decreasing the digitalis effect. Conversely, Hopper[4] reported a case in which the ECG changes due to hyperkalemia in a uremic patient were reversed by the administration of digitalis. The exact mechanism by which potassium exerts its influence on the normal heart and its relationship to the action of digitalis is not clearly understood.

It is possible that the benefit to our patient following the administration of potassium chloride was fortuitous. Spontaneous reversion to normal sinus rhythm might have occurred without it, but this seems unlikely for the following reasons: (1) Development of other cardiac arrhythmias (nodal tachycardia, multifocal extrasystoles, and bigeminal rhythm) suggested increasing rather than decreasing digitalis effect. (2) The patient was in negative potassium balance when admitted to the hospital (table 1). High urinary potassium in the presence of the relatively normal serum potassium implies cellular depletion of that cation to maintain the serum level. (3) Clinical experience of others had been similar to ours.[1-3] Cohen[1] included in his review the observations of several investigators who reported reversion to normal rhythm of various digitalis-induced arrhythmias following the administration of potassium salts. Of particular interest is the report by Lown and associates[3] of six patients, all on digitalis or one of the glycosides, who experienced 14 episodes of atrial tachycardia with block following either an increase in the dose of digitalis or excessive diuresis induced by mercury. The similarity between the electrocardiograms and clinical courses of those patients and of ours is striking. The dose of potassium, following which the rhythm returned to normal, varied from 40 to 100 mEq. of potassium ion, and the time from 45 to 120 minutes. In our patient the reversion occurred 75 minutes after the oral

administration of 24.4 mEq. of potassium ion (1.8 grams of potassium chloride). Lown at the same time reported five patients with various arrhythmias not caused by digitalis intoxication. In these the administration of potassium was without effect, despite induction of severe hyperkalemia in two of the patients.

These observations suggest that potassium salts are specific in the management of cardiac arrhythmias caused by digitalis intoxication, and may offer definite advantages over methods of therapy previously advocated with quinidine and procaine amide hydrochloride (pronestyl) which themselves have the propensity to cause cardiac arrhythmias. This danger apparently is not present when potassium is taken in the dosage prescribed. We believe that potassium chloride may be given safely, either orally or intravenously, to any patient with adequate renal function, and it is more reliable in bringing about a reversion to normal sinus rhythm than quinidine sulfate or procaine amide hydrochloride.

SUMMARY

Prompt reversion to normal sinus rhythm of a patient with atrial tachycardia with 2:1 A-V block caused by digitalis intoxication followed the oral administration of enteric-coated capsules of potassium chloride. Although reversion will occur in many instances without specific treatment other than the withdrawal of digitalis, an occasional patient requires more active measures because of persistence of the arrhythmia.

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Never become too self-reliant to utter a silent prayer in time of stress. This source of strength makes a physician out of a doctor of medicine.

—JAMES S. KLUMPP, M. D.
in *West Virginia Medical Journal*,
p. 41, Feb. 1954

THE PORTENT OF PULMONARY INFILTRATION OR FIBROSIS OF UNDETERMINED CAUSE

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SINCE February 1941, the Navy has required a roentgenogram of the chest as part of the physical examination to determine fitness for entry into active duty. In addition, since 1944, such examinations have been required prior to release from active duty and, when practicable, at annual intervals while in the service.[1] Frequently these roentgenograms reveal pulmonary defects suggestive of tuberculosis, the cause of which often cannot be determined during hospitalization for clinical evaluation. The disposition of persons with such defects has posed a problem because the diagnosis of tuberculosis was, in general, incompatible with retention of the member on active duty.

The policy has now been adopted that persons with evidence of pulmonary tuberculosis, considered to be of present clinical significance, are not retained on active duty. Evidence of pulmonary tuberculosis of no present clinical significance, particularly when discovered during the course of treatment for some intercurrent condition or during routine examination, is not a cause for separation from the service.[1] In a nonofficial publication, emphasis was placed upon pathologic, bacteriologic, and roentgenographic confirmation of the diagnosis of tuberculosis.[2]

In order to provide a classification for patients with lesions represented only by unchanging roentgenographic shadows, the following diagnostic titles were added to the nomenclature:[3] infiltration, pulmonary, cause undetermined; fibrosis, pulmonary, cause undetermined; and, calcification, pulmonary, cause undetermined. It was also directed that persons with roentgenographic findings which may be of future clinical significance shall have a roentgenographic examination of the chest every six months, when possible, using 14- by 17-inch film.[1]

A case review of tuberculosis in the Navy during 1949[4] revealed that the records of 12 percent of patients with active or

From Bureau of Medicine and Surgery, Department of the Navy, Washington, D. C.

recently active pulmonary tuberculosis contained evidence that they had been previously subjected to clinical study of varying degree of intensity for pulmonary defects discovered during routine or periodic roentgenographic examinations of the chest and returned to duty with one of the diagnoses stated in the previous paragraph, or with the diagnosis tuberculosis, pulmonary, minimal, or arrested. Frequently the lesion had progressed to moderately advanced or advanced stages before the hospital admission occurred during which active tuberculosis was recognized. These facts suggest an evaluation of the usefulness of the new diagnostic titles and of the risk of retaining those on active duty who have roentgenographic evidence of pulmonary lesions of undetermined cause.

The risk is implicit in the unknown nature of the defect and its possibilities for bringing about early retirement or serving as a source of dissemination of communicable disease. In an attempt to define the risk, the Individual Statistical Report of Patient (NavMed-F) for all naval patients who were originally admitted in 1949 for arrested pulmonary tuberculosis or for pulmonary infiltration, fibrosis, or calcification of undetermined cause, and returned to duty, were examined to discover those who had been invalided from the service during the next three years, 1950 through 1952. The medical records of all those invalided from the service were then examined to determine the relationship, if any, that the pulmonary defect detected in 1949 bore to the cause for the invaliding.

As shown in table 1, 117 persons were admitted and returned to duty in 1949 because of arrested pulmonary tuberculosis or a pulmonary defect of undetermined cause. None of the persons with pulmonary calcification was invalided subsequently. But of the 95 with arrested pulmonary tuberculosis and pulmonary infiltration or fibrosis, 10 (10.5 percent) developed active tuberculosis during the following three years while in the service. This percentage is significantly higher than would be expected for persons admitted to the sick list with other nontuberculous diagnoses. In all instances, the disease developed in or about the suspected lesion. Three patients had only minimal lesions; the remainder were diagnosed as moderately advanced. Because it is likely that some of the 117 persons comprising the total under consideration left the service for reasons other than physical disability during the three-year period, it cannot be stated that the 10 patients developing active tuberculosis comprise the total so affected.

The interval between discharge to duty and final admission was less than six months in four instances; three of these patients had acid-fast bacilli in their sputum or gastric content and, in each instance, admission followed a scheduled interval roentgeno-

TABLE 1. *Summary of thirteen patients, from group of 117 returned to duty in 1949, separated from the service in 1950-1952*

Diagnosis and number of patients returned to duty, 1949	Diagnosis of patients separated from the service, 1950-1952					
	Pulmonary tuberculosis				Anxiety reaction	Total
	Active, minimal	Active, moderately advanced	Arrested, minimal	Arrested, moderately advanced		
Tuberculosis, pulmonary, arrested, minimal (16)		1				1
Infiltration, pulmonary, cause undetermined (51)	3	2	1		1	7
Calcification, pulmonary, cause undetermined (22)						
Fibrosis, pulmonary, cause undetermined (28)		4		1		5
Total	3	7	1	1	1	13

graphic examination. Five remained on duty for 30 months or more before their final admission; one patient had acid-fast bacilli in the sputum and bacteriologic confirmation was obtained for two more

TABLE 2. *Incidence and total incidence rate, by age group, of patients returned to duty, 1949*

Diagnosis	Age group			
	Under 25 years	25-34 years	35 years and over	Total
Tuberculosis, pulmonary, minimal, arrested	4	6	6	16
Pulmonary infiltration, cause undetermined	18	15	18	51
Pulmonary fibrosis, cause undetermined	8	18	2	28
Total	30	39	26	95
Rate per 1,000	0.09	0.27	0.48	0.22

only after culturing material from tracheobronchial lavages; the admission of four of the five patients followed the latest of an average of 4.4 interval roentgenographic examinations. The remaining patient remained on duty nine months before admission

TABLE 3. *Incidence and total incidence rate, by years of service, of patients returned to duty, 1949*

Diagnosis	Years of service group			
	3-5	6-11	12	Total
Tuberculosis, pulmonary, arrested, minimal	5	3	8	16
Infiltration, pulmonary, cause undetermined	20	12	19	51
Fibrosis, pulmonary, cause undetermined	12	11	4	28*
Total	37	26	31	95*
Rate per 1,000	0.10	0.24	0.63	0.22

*Length of service of one patient not stated.

with positive sputum following his second interval roentgenographic examination.

As seen in tables 2 and 3, pulmonary infiltration or fibrosis of undetermined cause was diagnosed with greater frequency, during 1949, in the older and longer service groups. This was also true of those who later developed active tuberculosis, half of the patients having been in the service from eight to 19 years and in the 25- to 35-year age group, and only two having been less than 25 years old and having less than five years of service.

TABLE 4. *Incidence and total incidence rate, by category, of patients returned to duty, 1949*

Diagnosis	Officers	Marine Corps enlisted	Medical and dental enlisted	Aviation enlisted	All other enlisted	Total
Tuberculosis, pulmonary, arrested, minimal	2	1	1	3	9	16
Infiltration, pulmonary, cause undetermined	11	5	6	7	22	51
Fibrosis, pulmonary, cause undetermined	4	4	–	4	16	28
Total	17	10	7	14	47	95
Rate per 1,000	0.30	0.13	0.40	0.20	0.10	0.22

Table 4 classifies the persons under consideration according to rate or rank. They appear to be fairly well distributed. Although officers and medical and dental enlisted men and women had a somewhat larger proportion of cases than would be expected, the numbers are so small that little confidence should be placed on the differences. Those who developed active tuberculosis during the following three years include one chief gunner's mate, one chief aviation man, one electrician's mate, second class, one corporal, one fireman, two chief hospitalmen, one hospitalman, second class, one steward, first class, and one stewardsman. The sputum of one of the food handlers was positive, that of the other was repeatedly negative upon culture.

DISCUSSION

Of 95 persons returned to duty after careful clinical evaluation of roentgenographically detected pulmonary lesions described as infiltrative or fibrotic, 10 percent developed active tuberculosis within three years. Because it is not known if all these persons

remained in the service throughout the period of observation, the percentage developing active tuberculosis must be considered the minimum. Furthermore, because half of those who developed tuberculosis did so during the latter part of the period of observation, it is not unreasonable to anticipate that additional cases of tuberculosis, or other disease, will be detected as the period of observation is lengthened. The wisdom of requiring frequent roentgenographic examinations of the chest of persons with such lesions is apparent. It should be noted, however, that examinations made at even 6-month intervals occasionally fail to detect changes in lesions before the sputum of the patient contains tubercle bacilli. Hence, alert medical officers give careful consideration to minor symptoms of illness which arise in the intervals between scheduled re-examinations.

Tuberculosis has been one of the great "sea diseases" since decked ships came into use centuries ago.[5] There is little justification for retaining a tuberculous person in the Navy. When the evidence of tuberculosis is only suggestive, however, as in unchanging roentgenographic shadows of minimal extent, a policy of invaliding such affected persons would cause a loss to the service of many highly trained persons with long experience. The limited experience gained during 1949 suggests that most of those who remain in the service will continue with their health apparently unimpaired for three years. How long they may serve ultimately remains to be observed.

As long as routine roentgenographic examinations of the chest are required, diagnostic titles such as "infiltration, pulmonary, cause undetermined" and "fibrosis, pulmonary, cause undetermined" will be needed. The new titles have proved to have a definite usefulness in providing a classification, other than tuberculosis, for such lesions when bacteriologic, pathologic, or serial roentgenographic confirmation is not obtained. By means of this classification, a relatively small group of persons who require periodic re-examinations at short intervals can be readily identified. Furthermore, such groups can be included in subsequent studies to determine what diseases may be expected to occur in the evolution of the lesions. Use of the titles also avoids stigmatization of persons as tuberculous because of inconclusive evidence.

The problem of inactive pulmonary lesions discovered by means of routine roentgenograms is not restricted to the Navy, as is well attested in reports of surveys made in civilian populations.[6-11]

CONCLUSIONS

Ten percent of 95 persons with infiltrative or fibrotic pulmonary lesions detected during routine roentgenographic examinations of

the chest, who were discharged to duty following careful clinical study in 1949, subsequently developed active pulmonary tuberculosis in the naval service during 1950 through 1952. The remainder served part or all of this period without recognized impairment of health.

The diagnostic titles, infiltration, pulmonary, cause undetermined; fibrosis, pulmonary, cause undetermined; calcification, pulmonary, cause undetermined, not only are convenient for the classification of patients whose only physical defect, after careful clinical study, is an unchanging lesion defined in roentgenographic terms, but also are useful for the ready identification of a small but significant number of persons who may subsequently develop progressive or communicable disease.

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The Physician's Reward

The most satisfying reward one gets as a physician is not necessarily financial, but the respect of one's patients and one's community. It is the practice of the art which develops that respect.

—MELVIN A. CASBERG, M. D.
in *Medical Annals of the District of Columbia,* p. 43, Jan. 1954

LUMBOSACRAL SUBARACHNOID TAP FOR SADDLE BLOCK ANESTHESIA

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THIS report describes the details of a technic for saddle block anesthesia which at this hospital has consistently resulted in anesthesia of the sacral nerves.

A lumbosacral subarachnoid tap for spinal anesthesia was first proposed by Taylor[1] who used a lateral and caudad approach to the subarachnoid space at the lumbosacral interspace. Schuetz[2] used the Taylor method successfully in 100 urologic patients, but Surks and Wood[3] preferred an approach directly lateral to the lumbosacral interspace.

METHOD

An inspection of the lumbosacral interspace between the fifth lumbar vertebra and the sacrum (figs. 1A and 1B) reveals that it is the largest one in the spine. The lateral and caudad approach is used because the spinous process of the fifth lumbar vertebra usually overhangs the interspace in the midline.

The patient is placed in the prone position with arms above his head, his face turned away from the operator, and his legs slightly separated. The skin over the lumbosacral region is prepared and draped in the usual manner. The second sacral foramen is located about 1 cm. below and 1 cm. medial to the lowermost prominence of the posterosuperior iliac spine (fig. 2). Heavy pressure should not be used in palpating because a light touch reveals more of the position of the underlying bony structures. There is usually a definite skin dimple at the site of the posterosuperior iliac spine.

After a skin wheal is produced over the second sacral foramen, using 25 mg. of ephedrine in 1 percent procaine hydrochloride, the subcutaneous tissues are infiltrated in the direction of the

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fifth interspace. If the patient is of average size or smaller, a 7.5-cm., 20-gage, spinal needle is used. The needle is directed cephalad and medially from over the second sacral foramen toward the lumbosacral interspace at an upward angle of approximately 55° until the point of the needle is felt to enter the subarachnoid space. The drip of spinal fluid is usually active and permits easy aspiration.

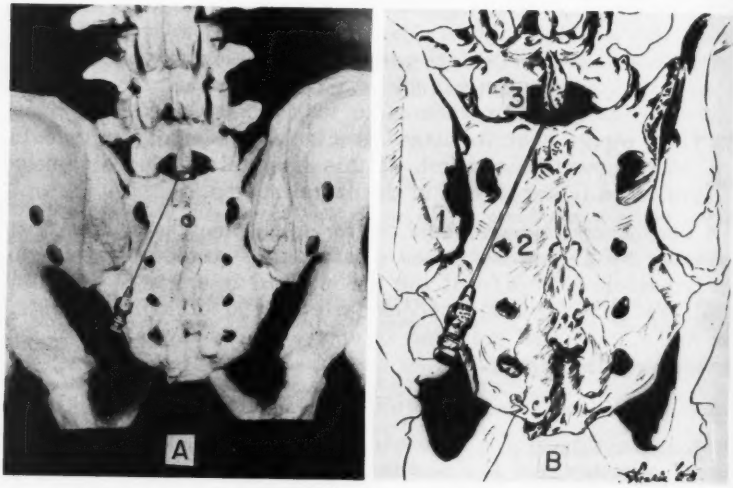

Figure 1. (A) *Photograph of a skeleton showing needle in place for the Taylor approach.* (B) *Pen and ink sketch of figure 1A. 1 = Posterosuperior iliac spine. 2 = Second sacral foramen. 3 = Lumbosacral space.*

For all patients a mixture of 0.5 cc. of 1 percent tetracaine hydrochloride and 3.5 cc. of spinal fluid is injected at the rate of 1 cc. per two seconds. This dosage was found to be adequate. The dose was not varied for weight and height.

RESULTS

This method was used on 71 patients at this hospital, the approach described by Taylor being closely followed. The majority of the patients were young men, although some women were included, who ranged in age from 18 to 65 years and in weight from 100 to 208 pounds. They were operated on during a four-month period for anorectal disorders and pilonidal sinuses, for which a low spinal anesthesia was desirable.

In this series, the skin anesthesia extended from the fifth sacral through the second sacral dermatomes and the patient was able to move his legs in every case. There was no nausea or vomiting, possibly because the patient was not required to

sit up during the procedure. There was no significant hypotension necessitating therapy of any kind. Some patients who had had previous spinal anesthesias preferred this method because of the

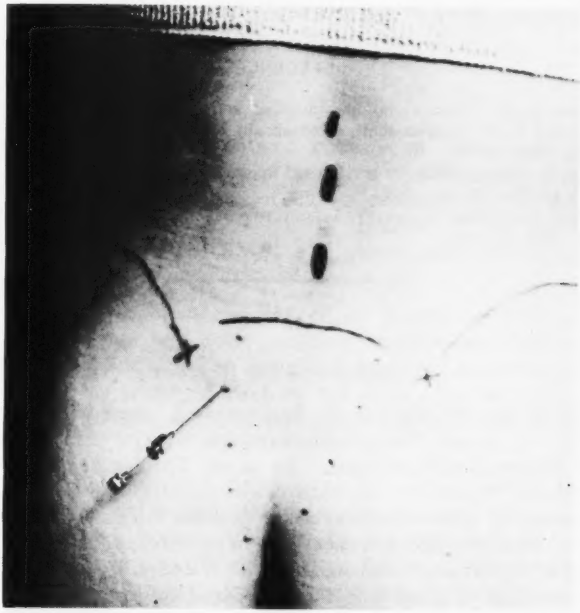

Figure 2. Photograph of patient showing landmarks for Taylor approach. "X" indicates location of posterosuperior iliac spine. Location of the second sacral foramen and the lumbosacral space can be determined by comparing with figure 1B.

more comfortable position during the procedure of subarachnoid tap. Postoperatively, only one patient complained of a typical postlumbar-puncture headache. This was of moderate severity, partially relieved by a tight abdominal binder, and subsided spontaneously in three days.

COMMENT

The Taylor method has all the advantages of any saddle block anesthesia, such as avoiding the possible complications of general anesthesia and obtaining the co-operation of a patient able to move his legs. Once the technic is learned, the procedure is easy to perform. Low spinal anesthesia may be obtained uniformly without tilting the patient or using a hyperbaric solution. The patient is comfortable in the prone position during the procedure. No particular difficulty has been experienced with obese patients, except that one should use a needle 15 cm. in length.

The method has the disadvantages and dangers of any spinal anesthesia,[4] but they are minimized if good technic is used. This can be varied to fit special requirements, the solution being made hypobaric or hyperbaric, and the position of the patient changed to produce any level of analgesia.

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Rupture of the Bladder

If rupture of the bladder is demonstrated, immediate surgery is mandatory to prevent further extravasation of urine and to drain perivesical tissue already permeated by urine. This is best accomplished by suprapubic cystotomy, drainage of the bladder by a suprapubic tube, and drainage of perivesical tissue by Penrose drains in cases of extraperitoneal rupture. The treatment for intraperitoneal rupture should be suprapubic cystotomy, drainage of the bladder by suprapubic tube, suction removal of urine from the peritoneal cavity, and closure of the peritoneum without drainage. If the ruptured area of bladder wall can be closed easily, it should be done, although this step is less important than those just mentioned. Usually a period of 7 to 10 days of drainage after cystotomy will suffice. At that time the suprapubic tube can be removed, and an urethral catheter can be placed to facilitate closure of the surgical incision. If there has been interruption in the continuity of the prostatic or membranous urethra, every effort must be made at the time of surgery to splint this segment with a urethral catheter, in addition to draining the bladder by suprapubic tube. Suprapubic drainage should be maintained for at least 10 days. The urethral catheter used to splint the ruptured urethral segment should remain for three weeks or longer.

—GEORGE C. PRATHER, M. D.
in *Journal of the American Medical Association*, p. 207, Jan. 16, 1954

FAT EMBOLISM

Report of Two Fatal Cases

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THERE are many pathologic conditions more rare than fat embolism, but few that are so often unrecognized clinically. The significant number of cases reported in the literature is of clinical importance, especially in time of war because of the increase in traumatic cases, and physicians should be more alert to the possibility of this condition.

Fat embolism was first recognized by Zenker in 1862, and by 1951 over 650 cases had been reported.[1] Statements regarding its incidence[2-7] vary widely. Fat embolism has been found at autopsy, not only following a major fracture but also after an injury without a fracture, a severe burn, puerperal sepsis, convulsions, or alcoholic delirium.

Most writers support the theory that fat emboli result from the breakdown of fat cells and the extrusion of their contents into adjacent veins and venules.[2,8] This is substantiated by the fact that fat embolism is usually discovered following fractures where veins are encased in a bony wall. Because of their noncollapsible walls, these vessels furnish easy access to fatty substances as soon as hemorrhage and exudation raise the local pressure above that of the venous pressure. Numerous cases, however, cannot be explained by this theory. Fat embolism has been observed following burns, poisonings, osteomyelitis, diabetes mellitus, eclampsia, pancreatitis, tuberculosis, and fatal conditions producing fatty necrosis. Obesity apparently is not a factor in the incidence of fat embolism, nor is its severity necessarily related to the degree of injury.

DIAGNOSIS

The clinical picture presented depends largely on the presence of fat emboli in the capillaries of the lungs, brain, skin, and kidneys which is followed by edema, hyperemia, and minute hemorrhages. Signs and symptoms may appear in a few hours but may be delayed for two or three days.[9] Cerebral signs may vary from slight irritability and excitability to maniacal periods and

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coma. The temperature may rise to 106° or 107° F., or even higher, and the pulse and respirations are also accelerated. Dyspnea and cyanosis may become prominent. There may be moist pulmonary rales and a cough, often productive of blood-tinged sputum. Petechial hemorrhages of the skin of the neck, chest, abdomen, and conjunctiva are fairly common. In severe cases, loss of sphincter control, muscular rigidity, convulsions, and sometimes Jacksonian seizures may occur.

The clinical diagnosis depends largely on the awareness of the clinician, and must be based principally on the history of trauma followed by various combinations of the above signs and symptoms. Occasionally fat globules may be seen in retinal vessels. A microscopic examination of the last portion of a urine specimen may show fat droplets. Numerous attempts have been made to establish diagnoses from blood and sputum examinations but without success. Pathologists may discover many incidental cases of fat embolism by seeking vacuoles in the glomeruli of kidney sections or in vessels of the lung parenchyma. A fat-stain technic must then be used for verification of the diagnosis.

There is no specific treatment for fat embolism, but oxygen, antibiotics, and general supportive measures should be given patients suspected of having this condition. The early immobilization of fractures is important prophylactically. Fortunately, most patients recover and the condition is not recognized clinically. The following two cases were observed at this hospital during 1952.

CASE REPORTS

Case 1. A 21-year-old Mexican man was admitted at 0650 on 20 September 1952 shortly after being struck by a taxicab. Comminuted fractures of the left tibia and fibula and a laceration of the right forearm were revealed on examination. He was in good general condition and well oriented.

Several hours after admission the fractures were reduced under local anesthesia with the insertion of Steinmann's pins in the upper portion of the tibia and in the os calcis. A cast was applied to the midthigh. About 1200 hours on 21 September the patient was drowsy, and shortly afterward he was difficult to arouse. The pulse and blood pressure were within normal limits and all extremities moved in response to painful stimuli. Pupils were equal and reacted to light. In late afternoon the patient became restless, although he remained unconscious. The rectal temperature rose to 105° F. and a few petechias appeared over the chest and right shoulder. There was no nuchal rigidity. During the evening the petechias spread over the chest, abdomen, and shoulders, and nuchal rigidity was observed, accompanied by intermittent episodes of extreme restlessness. Spinal fluid obtained from

lumbar puncture was questionably cloudy and contained 726 red blood cells but no leukocytes. Later the blood pressure fell from normal to 80/0, and the temperature rose to 106.6° F. Blood was drawn for culture and the patient was started on penicillin G procaine (crysticillin) intramuscularly and sulfadiazine intravenously. The diagnoses of intracranial injury, fat embolism, and meningococcemia were considered.

During most of the day of 22 September his condition was grave, with temperatures as high as 107.2° F., but his blood pressure was usually normal. Involuntary bowel movements and micturition occurred repeatedly. During the evening of 22 September apnea developed and his temperature rose to 108° F. Burr holes were drilled into the temporoparietal region of the skull while the patient was being given artificial respiration. No epidural or subdural hemorrhages were encountered, but there appeared to be increased pressure on the right side. Shortly afterward the patient died. A repeated microscopic urinalysis showing fat globules was reported.

Early cerebral signs had been observed about 30 hours following injury, and death occurred after 62 hours.

Autopsy findings. Many petechias were seen over the epicardial and endocardial surfaces of the heart. Pulmonary congestion was seen on section of the lungs, and the posterior aspect of the right lung appeared almost hemorrhagic. Fat globules were found distending the small vessels of the heart, lungs, spleen, liver, brain, and the spinal cord. The kidney also showed fat globules, especially in the glomeruli. These findings with hematoxylin-eosin stain were verified by special fat-stain technics. In many sections the occluded vessels were surrounded by inflammatory cells, chiefly neutrophils. Some macrophages were seen to contain blood pigment and fat vacuoles. Sections of the intestine, pancreas, adrenals, pituitary, and thyroid showed no emboli. One or two sections of the brain revealed subarachnoid hemorrhage. In some sections, fat globules were found within the small intracerebral vessels; these were verified by special stains. There was an occasional thrombus in one of the intracerebral vessels, but rarely were ring hemorrhages seen. Many stages and forms of neuron degeneration were observed.

Case 2. A 46-year-old man was admitted at 0630 on 21 April 1952 following an automobile accident. He was in shock and dull mentally. Comminuted fractures of both tibias and fibulas and fractures of the maxilla and mandible were revealed on examination. The neurologic examination was essentially negative except for a questionable Babinski reflex on the right. His blood pressure stabilized at 120/70, following the administration of

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whole blood and bed rest, and 38 hours after admission he was given a spinal anesthetic preparatory to the application of the casts. After being raised to a sitting position to produce a low level of anesthesia, he was returned to the supine position. The systolic blood pressure was 110, and he was moved to a firm table for reduction of the fractures. Within two minutes he coughed several times and his blood pressure fell to 70/0. Two minutes later his heart sounds became inaudible. A tracheotomy, artificial respiration, and direct transthoracic cardiac massage failed, and he died at 1540 on 22 April.

Autopsy findings. A fracture of the sternum, in addition to the other fractures, marked congestion of the lungs, liver, and kidneys, and moderate cerebral edema were found. The heart was moderately enlarged, but arteriosclerosis was not marked. The lung sections showed a severe degree of congestion and edema, and many pigment-laden macrophages were present. In most of these sections the fat globules were readily recognized within the arterioles, and were also found in sections of the pancreas, heart, liver, and kidneys. These were all confirmed by fat-stain technics. Sections of the spleen, adrenals, bladder, and prostate were essentially normal, and no fat globules were noted. The only pathologic change observed in the brain was cerebral edema.

Diagnoses of cardiac arrest, tetracaine hydrochloride (pontocaine) sensitivity, and massive pulmonary thromboembolism had been considered prior to microscopic studies following autopsy.

SUMMARY

Fat embolism is a common pathologic condition that is usually overlooked. Death following fat embolism may be sudden or delayed. Symptoms may be pulmonary, cerebral, or cardiac. The appearance of pulmonary edema in a patient with a fracture of the long bones should arouse suspicion. A sudden increase in respiration, marked elevation of temperature, cough, cyanosis, dyspnea, and the presence of rales in the lungs are all signs which have been observed. The presence of petechias over the abdomen, chest, neck, and conjunctivas, is particularly important. Associated head injuries frequently present a problem in the differential diagnosis. The pathologic diagnosis of this condition may be suspected from examination of routine hematoxylin-eosin stained sections, but must be confirmed by special fat-stain technics. The treatment consists of supportive measures, principally that of combating anoxemia.

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Anxiety in Severe Nosebleed

To appreciate fully the anxiety of a nosebleed, one must be called at 3:00 a. m. some morning and go to a patient's house. There you find a large, obese patient lying in a bed, damp and soggy, partly from melted ice and partly from blood. Her nightgown is spattered with blood. There is blood on the floor around a washbasin which is filled with clotted blood, and saturated tissues fill a paper bag. The patient is bug-eyed with fear, and standing around the bed, even more frightened, is one, two or three relatives, each of whom tries desperately to mop every drop, yes even every erythrocyte as it trickles from the upper lip.

Then comes the massive emesis! A large clot is propelled up from the stomach and into the basin. This swallowed blood is interpreted by all as being the patient's spleen, liver, or some other vital organ and an obvious peroral evisceration. This, of course, is an exaggerated and somewhat comic picture, but it testifies to the degree of psychic shock involved in this condition.

Under such circumstances as I have described, one should walk into the room and act as though he were completely oblivious to the blood, as though that huge basin of blood were mere spotting. Then take the blood pressure, pulse, and listen to the heart. While the sphygmomanometer is still on the arm, slowly inject intravenously meperidine or codeine, the dose and drug as indicated. The patient relaxes. Don't burst into the room, look at the patient, gasp, and then frantically start stuffing vaseline gauze down the patient's nose. This type of heroic acting may be appropriate for the situation of an emergency tracheotomy. However, this approach to the patient with nosebleed, who is already paralyzed with fear, is only going to raise the blood pressure to a head-throbbing level.

—RICHARD T. BARTON
in *Postgraduate Medicine*,
p. 72, Jan. 1954

GUILLAIN-BARRÉ SYNDROME

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RAY D. FOSTER, *Lieutenant, MC, USNR*

THE Guillain-Barré syndrome is characterized by sensory changes and paralysis with albuminocytologic dissociation in the spinal fluid. Its cause is unknown, but infectious, toxic, and allergic bases have all been implicated.[1,2] Recent reports describing the treatment of this condition with ACTH[3,4] and, on one occasion, with cortisone in addition to ACTH,[4] led us to consider the advisability of a trial of cortisone alone as a therapeutic agent.

CASE REPORT

A 20-year-old warehouseman was admitted to this hospital on 16 July 1953 complaining of numbness and tingling of the hands and feet and weakness of the legs and arms. He had been well and strong until 20 May 1953, at which time he was hospitalized here for six days with laryngitis and an upper respiratory tract infection. He was discharged from the hospital on 26 May 1953 and returned to his work feeling well. During the first week in July, he noted tingling and burning of the hands and feet, followed by a numbness which was severe enough to prevent him from using a typewriter. Shortly thereafter, he had difficulty climbing stairs because of weakness of the legs, and he noted that he was unable to support his weight on one leg. The numbness, tingling, and weakness continued and seemed to the patient to be advancing up the arms and legs. He had been seen at a civilian dispensary during the first week of his illness and treated empirically with vitamins without relief. Because of his progressive symptomatology, he was referred to this hospital. There had been no history of headaches, fever, diplopia, or dysphagia. No history of exposure to noxious fumes or poisons was obtained, nor was there any history of allergy.

Physical examination was essentially normal, with the exception of the neurologic findings. The patient walked on a wide base with a stepping type gait. The cranial nerves were normal, although taste and smell were not tested. Cerebellar tests showed the finger-to-nose test and the heel-to-shin test to be satisfactorily performed, although poorly, primarily because of muscle weakness. The Romberg test was questionably positive, but his muscle weakness made this a doubtful finding. Kernig's and Brud-

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zinski's signs were negative. Tendon reflexes were absent even with reinforcement. The only reflex obtained was the cremasteric, which was normal bilaterally. Generalized muscular weakness was present, with inability to perform dorsiflexion of the toes or the feet, and with weakness in pelvic girdle and in neck movement. The latter was particularly weak in the posterior flexion. The shoulder girdle appeared normal in strength. The patient was unable to rise from a squatting position. At the time of admission the hand grip was weak and he was unable to grasp a pencil. Temperature sensation was present in the hands and feet and in all other body areas. The patient was able to distinguish sharp from dull stimuli in all areas. The character of both of these stimuli changed bilaterally at about three inches below the elbow and at the level of the knee. Vibratory and superficial and deep pain sensations were normal.

On admission, a serologic test for syphilis and a urinalysis were negative and a complete blood count was normal. The sedimentation rate was 17 mm. at the end of the first hour. Lumbar puncture on 18 July 1953 showed clear fluid with a cell count of 1 and a total protein of 159 mg. percent. Spinal fluid sugar, chlorides, and colloidal gold were normal and the culture was negative. The Pandy test for globulin was positive. The blood nonprotein nitrogen was normal. A repeated spinal fluid examination on 5 August 1953 showed no cells; normal sugar, chlorides, and colloidal gold values; a negative culture; a total protein of 98.1 mg. percent with a trace of globulin by the Pandy test; and the serologic test for syphilis was negative.

Based on these findings, the diagnosis of Guillain-Barré syndrome was made and confirmed after four days of observation. Because of the progression of symptoms, and of reported successful treatment of this disease with both ACTH and cortisone, we decided to give the patient cortisone. It was begun on the fifth hospital day, orally, in doses of 300 mg. per 24 hours. On the following day, the patient reported that he was feeling better and that he had an increased strength in his hands. He was able to write with a pencil for the first time in a week. The paresthesias were unchanged.

The cortisone dosage was continued at the 300-mg. level until 27 July 1953. During that time, response to the 300-mg. dose of cortisone had been definite, but slight. The eosinophil count was 155 per cu. mm. Previous counts had not been done because necessary reagents had not been available at this overseas station. Because of the elevated eosinophil count, the dosage of cortisone was increased to 500 mg. daily for two days. The eosinophil count fell in 48 hours to 33 per cu. mm. and remained below 50 for the following month. Two days after the dosage of corti-

sone was increased, the patient felt definitely stronger. He arose on the morning of 29 July 1953, and made his own bed. The cortisone was then gradually reduced in 12.5 mg. steps at about three-day intervals. The patient's improvement was progressive and gradual with increased strength of the small muscles of the hands occurring more rapidly than in any large muscle groups. Paresthesias diminished slowly and less dramatically than weakness. The lumbar puncture findings on 5 August 1953 were normal with the exception of a total protein of 98 and cell count of zero. On 4 August 1953, cortisone was given intramuscularly because the supply of the oral form was exhausted. Twenty-four hours later, he felt weaker, had some increase in paresthesias, and experienced definite diuresis. Without change in dosage, diuresis and weakness were alleviated and he again improved. Because of an anticipated 30- to 60-day convalescent period, it was necessary to evacuate the patient by air to the United States for further treatment. It has been our belief that a course of ACTH given intravenously would be indicated should a relapse occur, but to date none has.

DISCUSSION

The prognosis of the Guillain-Barré syndrome is serious with mortality figures quoted at from 5 to 40 percent.[1, 2, 4] Many man-hours have been lost during convalescence. Dimercaprol, neostigmine, vitamins, and roentgen-ray therapy have all been tried, but no therapeutic approach has been entirely successful. Published reports hold hope for the use of steroid therapy. The patient reported appeared to obtain a genuine therapeutic response to treatment. This is substantiated by the fact that clinical improvement occurred in parallel to the drop in the circulating eosinophilia, indicating physiologic response to cortisone. The change in the patient's condition during the lag period, when parenteral administration of cortisone was substituted for the oral administration, also suggests therapeutic effect.

While the allergic hypothesis of the cause of Guillain-Barré syndrome is not entirely satisfactory, it would appear to offer a more logical explanation of the pathologic findings and the clinical course than other hypotheses. The oral administration of cortisone is less difficult than the parenteral use of cortisone or ACTH. It is particularly suitable for use in relatively small outlying medical establishments.

SUMMARY

A patient with Guillain-Barré syndrome showed improvement on cortisone with an initial dose of 300 mg. daily. Subsequently, his improvement ceased, but response was again obtained by

increasing the dose to 500 mg. daily. The results obtained are considered to represent a true therapeutic response.

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History of Culdoscopy

Endoscopic examination of the abdominal cavity began about 1910, shortly after the incandescent lamp was perfected, with the pioneer reports of Jacobaeus and Kelling. Even before this, cystoscopy had been done with artificial illumination, a sort of "candling," as it were. Followed, then, three decades of trial and error approach to the problem of easy, adequate pelvic visualization, varying from abdominal puncture with oxygen distension of the abdomen to cul-de-sac attack in the completely vertical Trendelenburg in efforts to empty the pelvis of obstructing bowel and bring the operator vis-à-vis with the remaining pelvic content.

It is inspiring to contemplate how man has searched out the little 2 by 4 cm. cul-de-sac partition left by Mother Nature as a secret passageway for the curious and intrepid intrapelvic explorer. Not irreverently, we sometimes suspect that the posterior vaginal septum must have been put there precisely for culdoscopy. All efforts, however, left the patient, and hence the method, on its back until Decker, in 1940, elevated a cadaver from prone to kneechest position to display the open sesame of present day culdoscopy. In 1942 he successfully visualized his pioneer live subject in the kneechest position and a new star was born in gynecologic diagnosis.

—BRUCE C. BUDGE, M. D.
in *Northwest Medicine*, p. 132, Feb. 1954

LARGE PRIMARY OMENTAL CYST SIMULATING ACUTE APPENDICITIS

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OMENTAL cysts of the peritoneal cavity occur very infrequently, and are most unusual when they present symptoms of an acute surgical abdomen. Recently, under the clinical impression that we were dealing with a perforated appendix, we operated on a two-year-old boy and discovered a large omental cyst undergoing pedicle torsion which was removed without incident.

CASE REPORT

A small, two-year-old boy was examined at this hospital on 20 July 1953, complaining of abdominal pain. Two days prior to admission he developed a low-grade fever and anorexia, but the following day he seemed well. The night prior to admission he complained of cramping abdominal pain and vomited once. On admission, he appeared acutely ill and had a temperature of 103° F. and pulse of 160 per minute. His face was flushed, but he was not especially dehydrated. The remainder of the physical examination was normal except for moderate distention and tenderness throughout his abdomen. The area of maximum tenderness was over McBurney's point, where referred pain and rebound tenderness were marked. A few high-pitched peristaltic sounds were heard. Rectally, the tenderness was greatest high on the right side of the pelvis. The urinalysis was negative and the leukocyte count was 27,000 with a marked shift to the left. A roentgenogram of the chest was within normal limits. Roentgenograms of the abdomen showed an area of homogeneous density occupying the entire right side and the lower half of the left side. A few loops of gas-filled bowel were noted in the left upper quadrant (fig. 1).

We believed this was most likely a case of peritonitis due to a ruptured appendix. Suitable preparation with intravenous fluids and antibiotics was carried out and the patient was taken to surgery. Under ether anesthesia, the abdomen was opened through

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a right lower rectus muscle-splitting incision. A huge blue cyst (fig. 2) was encountered which appeared to arise from the greater omentum on the right side and to be attached between the greater

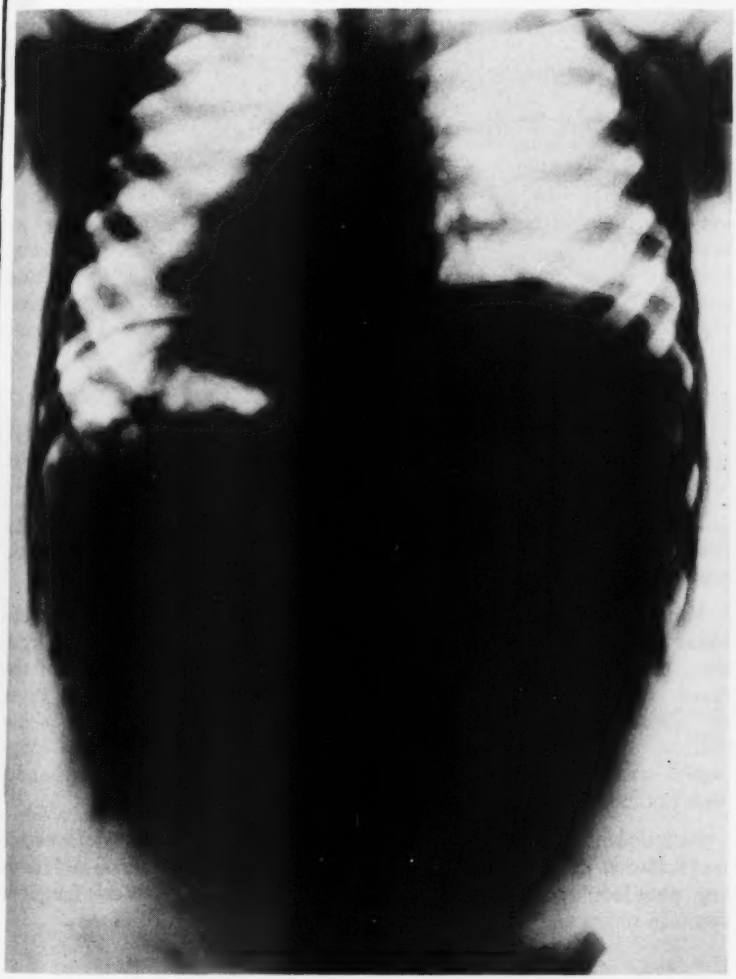

Figure 1. Roentgenogram of the chest and abdomen showing an opacity throughout both the lower and the right upper abdominal quadrants. A few gas-filled loops are seen in the left upper quadrant.

curvature of the stomach and the transverse colon. It had pushed the small intestines into the left abdominal cavity. During dissection we were able to untwist the pedicle, and the color of

the cyst returned to a healthy pink. After mobilizing the stomach and transverse colon, the entire cyst and pedicle were removed intact. An incidental appendectomy was then performed and the abdomen closed in routine manner.

Figure 2. Omental cyst, weighing 325 grams and measuring 20 by 17 by 5 cm., removed from the abdominal cavity of a two-year-old boy.

The patient immediately improved, and was discharged on the fourth postoperative day. Recovery has been entirely uneventful, and the wound is completely healed.

Multiloculated and filled with a fibrin and serum-like substance, the cyst weighed 325 grams and measured 20 by 17 by 5 cm., though partially collapsed due to the escape of some of the fluid. On section, it was found to be composed of a thin layer of fibrous tissue lined with endothelium. There was an acute diffuse inflammatory reaction throughout. The pathologic diagnosis was omental cyst with acute inflammation. The appendix was normal.

Subsequently the patient's mother disclosed that he had always had a prominent abdomen. He had been considered a "feeding problem" because of vomiting which necessitated frequent formula changes.

DISCUSSION

Beahrs and Dockerty[1] have classified omental tumors as primary solid and cystic tumors and secondary cysts. The latter may be due to fat necrosis or may occur following trauma with hematoma formation and subsequent liquefaction; others may be formed about foreign bodies left in the abdomen, or be due to an hydatid cyst.

Symptoms produced by omental cysts are not pathognomonic. Montgomery and Wolman[2] have noted that those caused by such lesions generally fall into one of three groups. In the first group, they are due to the size of the tumor which causes abdominal enlargement. In the second group, symptoms are produced by torsion of the pedicle or rupture of the cyst. This group usually is operated on under the diagnosis of an acute abdomen. The third group includes asymptomatic patients in whom the condition is incidental to a surgical procedure or found at autopsy.

Of 29 cases of omental cysts reported by Beahrs and Dockerty, 22 were asymptomatic and were discovered incidentally during an operation or at autopsy. Of the remaining seven, five were primary and producing symptoms. In this latter category, the preoperative diagnosis was appendicitis in one patient, and abdominal enlargement of undetermined causes in four. Fitts and Harvie[3] also reported a case of primary omental cyst masquerading as acute appendicitis.

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Psychiatry and the Practice of Medicine

Whether he knows it or not, every physician uses psychotherapy. It may be good or bad, depending on his attitudes, actions and reactions, his conduct, his ability to listen, his knowledge in knowing what to say and when to say it. If and when psychiatric knowledge of this all-important phase of professional work can be imparted more adequately and more clearly to medical students, we can expect a further improvement in the practice of medicine. It is a part of the "art" of medicine but now much of it can be taught.

—WILLIAM C. MENNINGER, M. D.
in *Psychiatric Bulletin,*
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UNUSUAL FINDINGS IN VAGINAL EXAMINATION FOR SUSPECTED PLACENTA PRAEVIA

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TWO instances of unusual findings on vaginal examination of patients with vaginal bleeding late in pregnancy are reported in this communication.

All patients with vaginal bleeding in late pregnancy are admitted to the hospital and put to bed. Specific examination is deferred until blood loss has been treated by transfusion. With the cessation of bleeding placentography is accomplished. Following this, sterile vaginal examination is performed in order to confirm the presence of placenta praevia not defined by placentography or to uncover less serious causes of bleeding. With marginal placenta praevia, under appropriate circumstances such as continued bleeding, adequate dilatation of the cervix, and viability of the infant, the membranes are ruptured in order to induce labor, or if labor is in progress, to produce tamponade of the placenta by the vertex. Patients with total or practically total placenta praevia are treated by cesarean section.

The technic of vaginal examination is as follows: With whole blood available, an intravenous infusion of saline is started and a sterile examination performed. The vaginal fornices are first explored and any bogginess or irregularity of contour noted. Following this, the external os is very gently palpated, with simultaneous pressure on the fundus of the uterus. Attempts to visualize the cervix are withheld until digital examination has been accomplished.

CASE REPORTS

Case 1. A 24-year-old para 1 gravida 4 abortus 2 was admitted on 8 March 1952 with a history of spotting throughout her pregnancy and vaginal bleeding approaching the amount of a normal menstrual period for three to four days prior to admission. She

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was an unregistered patient and had had no prenatal care. Her last normal menstrual period was about the middle of August 1951, and her expected date of confinement, late May 1952. Her past history revealed one full-term pregnancy in 1947 with a 24-hour labor and the normal delivery of a six-pound infant, now living. She then had two successive spontaneous abortions at four and one half and five months, in 1950 and 1951, respectively.

Admission examination revealed a small fetus, consistent with the menstrual history, in a vertex presentation with the presenting part floating. The hematocrit was .36 percent; hemoglobin, 12 grams; and red blood cell count, 4,160,000. Urinalysis was within normal limits. Bleeding was minimal at the time, and the uterus was soft and not irritable.

Bleeding had ceased the day after admission, and placentography was done. This was reported as showing "the placenta lying posteriorly and to the left, not thought to be a praevia, unless a marginal one." It was decided to keep the patient on bed rest and allow the baby to develop further, as long as the bleeding was not marked. She was given 1 gram of ferrous sulfate daily in addition to supplementary vitamins and a high protein diet. She continued to pass large clots every two to three days. The hemoglobin and hematocrit remained within normal limits. Cross-matched blood was also constantly available. During this period, the vertex descended into the pelvis under the force of frequent Braxton Hicks contractions.

On 8 April 1952 active bleeding recurred and several large clots were passed. Because the fetus now appeared to be viable, it was decided not to delay the vaginal examination. Sterile vaginal examination was done as previously described. The fornices were gently explored and found to be boggy posteriorly and on the left. The cervix was then gently palpated and the external os noted to be almost completely effaced and about 5 cm. dilated. An irregular margin of placenta covered the os on the left. The vertex was at the ischial spines and in a right occiput anterior position. About three fourths of the cervical opening was thought to be covered by thin membranes, through which the sutures of the fetal skull were readily palpable. The membranes were then artificially ruptured and about 100 cc. of clear amniotic fluid allowed to escape. The vertex immediately descended and acted as a tamponade against the placental margin. There was no bleeding during the procedure. The uterus, previously irritable, began to contract mildly.

Fifteen minutes later the patient had two strong uterine contractions and precipitously delivered a living premature infant

weighing three and one half pounds, over an intact perineum and without anesthesia. The placenta was delivered by simple expression. Examination of the placenta revealed an hiatus the size of the fetal head, about 6 to 7 cm. from the lateral margin. This area was extremely thin, with a few bits of shaggy tissue adherent to the chorionic surface. This extremely thinned out portion of the placenta had been mistaken for membranes at the time of vaginal examination and was the "membranes" which were artificially ruptured and through which the infant was delivered. The total blood loss at delivery was estimated at no more than 100 cc.

The patient's subsequent course was afebrile and uneventful, and she was discharged on the fourth postpartum day. The infant was kept in the hospital for a short time following the mother's release, then was discharged in good condition.

Case 2. A 25-year-old para 3 gravida 4 was admitted on 4 June 1952 with a history of a gush of bright red blood mixed with "water" about seven hours prior to admission that occurred while she was voiding. The patient noted continued vaginal bleeding throughout the day, with leakage of fluid and the passage of occasional clots. There were no contractions. Her last normal menstrual period was 1 October 1951 and her estimated date of confinement, 8 July 1952. Two and one half weeks prior to admission, she noticed a bloody vaginal discharge for one day. Her first prenatal visit was on 26 May 1952. At this time the results of the examinations were: an adequate pelvis; chest roentgenogram, cervical smear, and Kahn test negative; blood type A, Rh positive; hemoglobin, 11 grams; and urinalysis within normal limits. The average blood pressure was 110/70.

Past history revealed a full-term baby, weighing seven pounds, born of her first pregnancy. The infant died shortly after delivery and she was told that "the afterbirth came first, and the baby didn't get enough blood." She was not given a blood transfusion at that time. The second and third pregnancies were full term and uneventful. Both of these children are alive.

On admission, her blood pressure was 92/60; pulse, 84; temperature, 99° F.; and respiration, 18. A small fetus presented in the left occiput transverse position, with the presenting part floating. Hemoglobin was 12.1 grams; hematocrit, 36 percent; red blood cell count, 3,750,000; and urinalysis within normal limits. On the day of admission, the patient bled enough to soak one perineal pad every two hours. The following day, the hemoglobin was 9.3 grams and the hematocrit, 31 percent. Blood had been cross-matched on admission, and she was given a 500-cc. transfusion which raised her hemoglobin to 11.5 grams. Her bleeding persisted intermittently during the day.

Three days after admission, bleeding had ceased entirely, although she continued to lose small amounts of amniotic fluid. Labor began the fourth day after admission and bleeding was again noted. The vertex was still floating and the fetal heart tones were good, at 140 per minute. A sterile vaginal examination was performed with the following findings: the vertex was about 3 cm. above the ischial spines, and the fornices were rather boggy all around. The cervix was explored gently and found to be 3 to 4 cm. dilated, with about 50 percent effacement, and moderately soft. The placenta was palpable completely across the external os, with the exception of a small area, 2 cm. in diameter, through which the bare vertex was palpable. About 150 cc. of blood clot was present in the vagina. These findings were thought to represent an almost complete placenta praevia.

A low cervical cesarean section was performed under cyclopropane anesthesia with very little bleeding. The placenta was found to be a total praevia, mainly attached to the right and posterior walls of the uterus and extending 5 cm. past the left margin of the internal os. A perforation about 2 cm. in diameter was noted in the center of that portion of the placenta which had covered the cervix. This area was composed of thinned out placental tissue and covered on the chorionic side with a few tiny bits of shaggy tissue. It was through this portion that the "membranes" spontaneously ruptured, and through which the vertex had been palpable at the time of vaginal examination.

The patient was given a transfusion of whole blood in the operating room and again postoperatively. The following day, her hemoglobin was 12.1 grams and the red blood cell count, 3,750,000. Her subsequent course was uneventful and afebrile. She was discharged on the tenth postoperative day. The infant, which weighed five pounds one ounce at birth, was kept in the hospital for a few more days.

DISCUSSION

The two cases reported, although different with respect to history and eventual method of treatment elected, are similar because the initial impressions formed after careful vaginal examination proved to be in error. The first patient was treated by rupture of the "membranes" on the assumption that a marginal placenta praevia was present; the second was treated by cesarean section because an extensive although partial placenta praevia was thought to be the cause of the bleeding. The first was delivered through an hiatus in the placenta, in an area in which it was of membranous consistency. In the second a similar but much smaller hiatus was found, through which amniotic fluid had escaped at the time of initial bleeding and through which the fetal skull was easily palpable at vaginal examination.

It is conceivable that due to the inherently poorer blood supply in the area of the cervix, the placentas of both patients did not reach full development in that portion which covered the internal os, or the continued pressure of the presenting part may have caused a pressure necrosis of the villi in that area. It may be that these conditions contributed to the poor development of the villi in the portion covering the cervix.

SUMMARY

Two patients with total placenta praevia, both managed conservatively, presented unusual findings on vaginal examination. On initial pelvic examination the condition was incorrectly diagnosed as marginal and partial placenta praevia, respectively. One patient was delivered vaginally without difficulty and the other was treated successfully by low cervical cesarean section.

Cholesterol in Atherosclerosis

Not so long ago it was widely held that arteriosclerosis, and the particular variety called atherosclerosis, was an essential part of aging. The result was a defeatist attitude and a regrettable lack of research interest. Now, however, it is clear that age alone does not bring with it the cholesterol deposits in the arteries that currently constitute the basic cause of more deaths in the United States than any other disease category.

Atherosclerosis is a progressive development and it seems highly probable that the eventual appearance of clinical coronary disease usually represents the cumulative effect of a factor, or factors, operating over a period of years. Age, per se, is certainly not the cause, as is evident from the great variations between individuals of the same age in spite of a general *average* progression with age. Many factors are probably involved in the atherosclerotic development and in the clinical appearance of coronary heart disease, but there is no longer any doubt that one central item is the concentration, over time, of cholesterol and related lipids and lipoproteins in the blood serum. No other etiological influence of comparable importance is as yet identified.

—ANCEL KEYS, Ph. D.
in *American Journal of Public Health,*
p. 1399, Nov. 1953

INVOLUTION OF THE THYMUS FOLLOWING SEVERE BURN

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IN 1928, Marine[1] suggested that a reciprocal relationship exists between the size of the thymus and of the adrenals. Clarification of this problem was delayed until potent adrenocortical hormones became available for general clinical and experimental use. Dougherty and White[2] showed that in animals the total mass of lymphoid tissue varies inversely with the activity of the adrenal cortex. Selye[3] pointed out that involution of the thymus and of other lymphoid tissue is a prominent feature of the "alarm reaction." That this reduction of lymphoid tissue is under the control of the adrenals is indicated by the fact that it can be prevented by hypophysectomy or adrenalectomy; or, in the absence of these glands, it can be elicited by adequate doses of adrenocortical hormones.

This report includes our observations of the involution of an enlarged thymus, which was roentgenologically demonstrable, in a severely burned patient.

CASE REPORT

A three-week-old girl received burns of the face, the upper extremities, and the chest when her crib caught on fire. Roentgenograms of the chest, taken when the infant was one week old because of dyspnea and cyanosis, showed a well-circumscribed density in the right lung field consistent with a congenitally enlarged thymus gland. The dyspnea and cyanosis subsided within four days and the patient was sent home. The mass, however, was unchanged at the time of discharge and on a follow-up roentgenogram which was taken six days later and two hours before the infant was burned (fig. 1).

The patient was admitted to this hospital 10 hours after the accident. She appeared to be well developed and weighed about seven pounds. There were partial-thickness burns over the en-

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tire face, the neck, and both arms and full-thickness burns over both hands, parts of both arms, and a 6- by 8-cm. area on the chest. An estimated 20 percent of the body surface was burned.

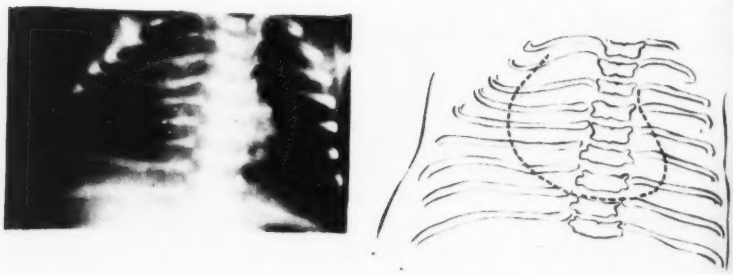

Figure 1. Roentgenogram of chest of three-week-old infant, taken two hours before she was burned.

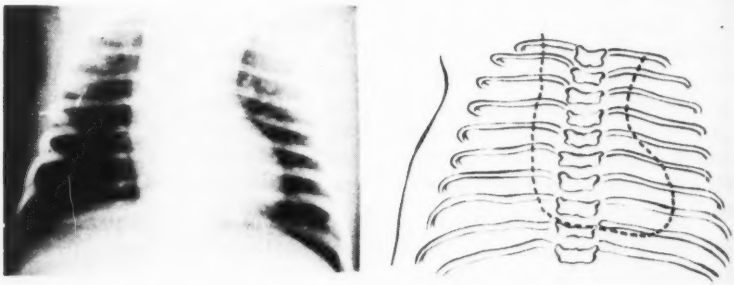

Figure 2. Roentgenogram of chest taken 15 hours after the infant had been burned.

There was no evidence of respiratory tract injury, other than that her respirations were rapid and shallow, she was slightly cyanotic, and oxygen therapy was necessary for the first 72 hours. Fluids were given in accordance with the suggestions of Kyle and Wallace[4] for the treatment of burned children. The signs and symptoms of circulatory insufficiency and water and electrolyte deficit were never evident. ACTH or cortisone were not given at any time. A roentgenogram taken about 15 hours after the infant had been burned revealed the mass in the right lung field to be definitely smaller (fig. 2). Eosinophil counts and steroid excretion studies unfortunately were not done.

Twelve days after the injury, all full-thickness burned areas were debrided, and 48 hours later skin grafts were applied to the burned areas of the upper extremities. At the same time, four fingers of the left hand, which were charred, were amputated at

the metacarpophalangeal joints. The full-thickness burn of the chest was grafted 14 days later. All of the burns healed with a minimum of scarring. The burns of the face were deep dermal in character and healed without grafting. The patient was completely healed 55 days after burning. A roentgenogram taken 87 days after injury showed enlargement of the mass in the right lung field (fig. 3), and another taken 15 months after injury showed persistence of the mass. The child has remained symptom-free.

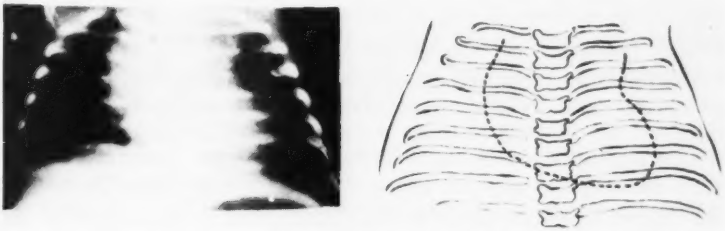

Figure 3. Appearance of chest 87 days after infant had been burned.

DISCUSSION

Although status thymicolymphaticus has been mentioned in the literature for over 400 years, its existence as a separate entity is doubtful. The diagnosis is usually made at autopsy in patients who have died suddenly after minor trauma or disease. The outstanding pathologic features in these patients are enlargement of the thymus and of other lymphoid tissues, and hypoplastic adrenal cortices: inability of the adrenals to respond to stress has been proposed as an explanation of death. It has been demonstrated, however, that thymic enlargement occurs frequently in normal children and that, in the great majority of instances, this does not impair resistance to stress. The patient described in this report had an enlarged thymus and withstood well the severe stress of a burn.

Thymic enlargement has been reported in over 50 percent of patients who have myasthenia gravis, and good results have been reported in some of these patients after thymectomy. Because of this observation and because of the inverse relationship between lymphoid tissue and adrenocortical activity, ACTH has been given to patients who have myasthenia gravis, both those with and without thymic enlargement. In five patients who had myasthenia gravis associated with thymic enlargement, Soffer and associates[5] noted a decrease in the size of the thymus after ACTH therapy (50 mg. daily given intramuscularly for from four to 16 days).

Nonspecific stress, the specific stress of burning, ACTH, and adrenocortical hormones are known to cause involution of lymphoid tissues, of which the thymus is a part. In all of these, lymphoid involution is mediated through the adrenocortical hormones.

The roentgenogram of the chest taken 15 hours after the injury revealed definite shrinkage of the mass previously observed. In all probability, it was an enlarged thymus. Its rapid shrinkage apparently was brought about by the increased secretion of adrenocortical hormones, initiated by the stress of burning. This appears to be a dramatic, visible, structural change caused by a specific physiologic response to stress.

Because roentgen irradiation can cause involution of the thymus, the total irradiation received by this infant has been calculated. Six roentgenograms were taken before injury, at an approximate dose of .8 of a roentgen unit per film; the patient thus received a total of 4.8 r. u. prior to the burn. This is far below the minimum of radiation necessary to cause an involution of the thymus.

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Coronary Disease in Physicians

Coronary heart disease illustrates well the problems in evaluating the health status of doctors. The data available for the most part seem to substantiate the commonly held concept that coronary disease is the doctor's occupational disease. This is a plausible assumption when one considers the burdens on the doctor in a society in which few people are free of insecurity and anxiety. Dublin states, "For two of the important causes of death, cancer and diseases of the coronary arteries and angina pectoris, the mortality of specialists, as a unit, is not much better than that of the nonspecialists * * *. Apparently, whatever benefits specialization may bring, they are not enough to overcome the tensions of medical practice in general * * *.

—HERBERT K. ABRAMS, M. D.
in *GP*, p. 46, Jan. 1954

REFLEX ANURIA

Report of a Case

CHARLES A. MOORE, *Captain, MC, USA*
CLAUDE C. DODSON, *Colonel, MC, USA*

ACCORDING to Lattimer[1] there are three general factors which produce anuria: (1) extrarenal; (2) renal; and (3) post-renal. Combinations of factors may occur. Reflex anuria may be renal or post-renal. A survey of the literature revealed a paucity of reports of reflex anuria following retrograde pyelography. A recent report by Tomlin and Quilter[2] described such an incident in a patient who was treated by epidural blocks and made a good response.

This communication is a report of a case of reflex anuria occurring in a patient with Raynaud's disease and scleroderma following a retrograde pyelogram.

CASE REPORT

A well-developed, well-nourished, 46-year-old man was admitted to this hospital on 20 October 1952 for evaluation of his Raynaud's disease and scleroderma. His chief complaint was ulceration of his fingers and pain in his toes. There was increased pigmentation, wrinkling, thickening, and lack of elasticity of the skin, which over the tips of the fingers and toes was especially thick, red, shiny, cold, encrusted, and ulcerated. Blood pressure was 160/80 on admission, but subsequent determinations were in the vicinity of 130/85. Peripheral pulses were normal.

In the course of a thorough workup, an intravenous pyelogram was obtained. This revealed a possible filling defect in the right middle calyx and poor detail on the left. On 10 November a bilateral retrograde pyelogram was normal. No difficulty was encountered in carrying out the procedure. On return to his ward from the urology clinic, he experienced considerable bilateral, posterior flank pain requiring repeated sedation during the ensuing 24 hours. Because by the following morning he had not urinated and catheterization was not productive of any bladder urine, he was transferred to the urology service. An indwelling catheter was inserted. Blood pressure at this time was 170/120.

From Brooke Army Hospital, Fort Sam Houston, Tex.

He was still experiencing pain in both flanks and examination revealed moderate tenderness in the posterior flanks bilaterally.

He was given rapidly 1,000 cc. of 5 percent dextrose in water containing 1 gram of procaine intravenously without effect. Therefore, a continuous spinal anesthetic of tetracaine hydrochloride (pontocaine) was given. This was discontinued after four hours because there was no change in the patient's status. The anesthesia persisted for two more hours but he remained anuric.

Total fluid intake (intravenous and oral) for the first 24 hours following the patient's transfer to the urology service was 2,100 cc. Subsequently, he was placed on a daily fluid intake of 750 cc. plus "output." He continued to have bilateral flank pain requiring sedation. He excreted only a few cubic centimeters of bloody urine in the two days following the retrograde pyelogram.

About 54 hours following the retrograde pyelogram he began to excrete bloody urine with a specific gravity of 1.011. In the ensuing four hours he excreted 500 cc. of urine. Diuresis continued for approximately 24 hours following which urinary excretion was normal, although gross hematuria continued for five days and microscopic hematuria for about two weeks. Fluid intake was increased to normal following onset of diuresis.

The blood urea nitrogen, which had been normal on admission, was 39 mg. percent 24 hours after onset of anuria and reached a peak of 71 mg. percent 48 hours after onset of diuresis. Five days after onset of diuresis, the blood urea nitrogen was 17 mg. percent. Other laboratory studies including electrolytes were essentially within normal limits.

Except for mild headache, the patient became asymptomatic and was discharged on 21 November 1952. He has continued to receive therapy for Raynaud's disease and scleroderma over the past year. Follow-up urinary tract studies during this period have revealed no evidence of a residual pathologic lesion.

DISCUSSION

The pathologic physiology involved in anuria resulting from ureteral trauma is not well defined. It would seem to be on the basis of a reflex neural stimulation producing renal shutdown. However, the experimental evidence is contradictory. Trueta and associates[3] reported a vascular shunt by way of the juxtamedullary vessels following sciatic stimulation in animals, resulting in cortical ischemia and anuria. Subsequent experiments by Barrie and co-workers[4] and Moyer and Handley[5] did not support this theory.

The present case apparently represents reflex anuria from ureteral catheterization. The ureteral trauma was minimal because the procedure itself was carried out with relative ease and was not prolonged. Whether the existing Raynaud's disease and scleroderma in the patient had any bearing on the development of reflex anuria is only problematical.

SUMMARY

A patient with Raynaud's disease and scleroderma developed reflex anuria following a retrograde pyelogram. Procaine given intravenously and tetracaine hydrochloride given continuously for spinal anesthesia were without effect. The onset of anuria was immediate following the retrograde pyelogram. Diuresis occurred spontaneously 54 hours later. Recovery was complete. Retrograde pyelography is ordinarily an innocuous procedure but is not without a rare complication.

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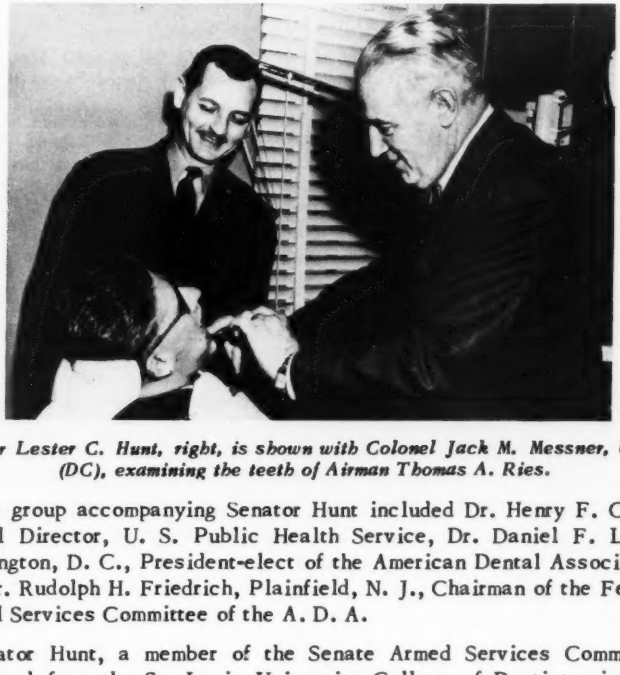
Medical Library Association Meeting in June

The Medical Library Association will hold its fifty-third annual meeting in Washington, D. C., 15-18 June, with headquarters at the Statler Hotel. The Armed Forces Medical Library will act as official host. The agenda will include discussions on medical research by embassy attachés; tours of the National Institutes of Health, the National Naval Medical Center, and the Armed Forces Medical Library; and addresses by Dr. Detlev Bronk, President of the Rockefeller Institute of Medical Research, Lt. Col. Frank B. Rogers, Director of the Armed Forces Medical Library, Mr. Verner Clapp, Acting Librarian of Congress, and Dr. Raymond Zwemer, Chief of the Science Division, Library of Congress.

Miss Marian Dondale, Librarian at the Albany Medical College Library, Albany, N. Y., is president of the Association; and the president-elect is Miss Wilma Troxel, Librarian at the University of Illinois Medical School Library, Chicago, Ill.

Senator Hunt Examines Patient During Visit to Dental Clinic

On a recent inspection of the U. S. Air Force Dental Clinic at Bolling Air Force Base, Washington, D. C., United States Senator Lester C. Hunt of Wyoming momentarily resumed the practice of dentistry with a patient from his own state. Airman Thomas A. Ries of Cheyenne, a tuba player at the United States Air Force Bandsman School, was awaiting an appointment in the clinic when the senator and his party arrived. They were introduced by Colonel Jack M. Messner, USAF (DC), commander of the 1100th Dental Squadron, and Senator Hunt examined the airman.



Senator Lester C. Hunt, right, is shown with Colonel Jack M. Messner, USAF (DC), examining the teeth of Airman Thomas A. Ries.

The group accompanying Senator Hunt included Dr. Henry F. Canby, Dental Director, U. S. Public Health Service, Dr. Daniel F. Lynch, Washington, D. C., President-elect of the American Dental Association, and Dr. Rudolph H. Friedrich, Plainfield, N. J., Chairman of the Federal Dental Services Committee of the A. D. A.

Senator Hunt, a member of the Senate Armed Services Committee, graduated from the St. Louis University College of Dentistry in 1917 and, after serving in the U. S. Army during World War I, practiced for many years in Lander, Wyo. He is a Fellow of the American College of Dentists and former president of the Wyoming State Dental Society.

DOCTORS FOR THE ARMED FORCES

REAR ADMIRAL LAMONT PUGH,
Surgeon General, U. S. Navy

IN the period since the end of World War II, the Medical Department of the Navy has undergone certain changes, not only to keep abreast of the times and fulfill its mission but also to enhance its attractiveness in the estimate of the medical personnel upon which it has to rely in the fulfillment of its mission.

Since 1945, the Nation's medical schools have graduated eight classes with an average yearly output of approximately 5,850, totaling some 46,800 doctors. Those post-World War II doctors are distinguished upon three notable counts: First, by reason of a precise and exacting screening standard, those who have gained admittance to medical school during this era have attested to their scholarly superiority. Second, these individuals have, through inherent intelligence and diligence of application in basic training and postgraduate pursuits, brought to medicine the highest degree of professional erudition, skill, and competence attainable by so youthful an aggregation in this or any other country, Third, these doctors, despite all the efforts and measures designed to influence them favorably, have shown conspicuously little relish for service with the Armed Forces. Various reasons or explanations have been advanced for this lack of enthusiasm to enter the Medical Corps of the Army, Navy, or Air Force. One reason, and a commendable one, has undoubtedly been the eagerness of these young physicians to acquire the professional excellence mentioned above. However, it will neither be contended that there is ample evidence against this being the only reason, nor will additional reasons be advanced. Rather let's review the record of medical officer procurement during the post-World War II era. While this review relates primarily to the Navy, the particulars cited are applicable to the Army and Air Force.

Immediately following the cessation of hostilities in August 1945, there promptly ensued a general exodus from the Medical

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Department, similar to that from all other departments of the Navy. The abandon with which this general demobilization, as it related to medical personnel, could be allowed was conditioned by the necessity of retaining sufficient doctors on active duty to perform physical examinations upon the homeward-bound legions before their separation from the service.

In any event, "school was out" and within a short period the ranks of the Medical Corps had been depleted to a minimum, irreducible in the estimation of our planners. This, however, was considerably before all of those of a nostalgic turn of mind had been accommodated, and so as early as 1945 the resort to some expedient to either hold or recall sufficient doctors to meet the basic needs of the Navy's Medical Department had become necessary. Up to this time these personnel needs have continued to be provided by a succession of expedients. Most of us will agree that sufficient time has now elapsed to permit us to determine fairly definitely just what is the situation and the *raison d'être* as well. Similarly it will be agreed, it is thought, that not only has sufficient time elapsed to justify remedial action but that a failure to institute such action after viewing the state of affairs realistically would constitute a serious dereliction.

Navy V-12 College Training Program:

1. Total number of students who participated in the V-12 program at medical schools		11,176
2. Separations and dispositions other than acceptance of an appointment in the Medical Corps of the Naval Reserve		6,398
a. Physical reasons, academic failure, disciplinary action, et cetera, prior to graduation from medical school	1,183	
b. Separated under Point System	233	
c. Declined superseding appointment either as USN or USNR	816	
d. Accepted appointment as Ensign, H-V(P) USNR, to continue in medical school	872	
e. Elected to accept discharge from USNR upon termination of V-12 Program or transferred to USNR status not under cognizance of the Bureau of Medicine and Surgery	2,844	
f. Accepted appointment in Medical Corps of the Regular Navy and are at present in the Regular Navy (estimated)	450	
3. Accepted superseding appointment in Medical Corps of the Naval Reserve		4,778

We as a nation have come to represent the world's most important bastion between the way of life created by our forefathers and a diametrically opposed philosophy. We are looked upon by many people of the world as the chief defenders of their faith and the chief holders of their hopes. It rests upon this

Nation to maintain a potent national defense establishment, if we would insure ourselves and those dependent upon us against serious reverses. It is an accepted axiom of a military organization that its cardinal mission in time of peace is to prepare for war and its most unequivocal responsibility is to be ready for war when and if it comes. If that concept is valid for the military services as a whole, it is equally valid for any individual department thereof—in the instance in point, the Medical Department.

There is no resource more important in the maintenance of such an establishment than the men and women who constitute its personnel. There is no entity related to personnel of more vital concern to us than the health of that personnel. Whether prompted by humane instincts, patriotic impulses, or the law of the land, it goes without saying that the adequate protection of this important element rests squarely upon the medical departments of the Armed Services. Provision of a sufficient number of properly trained medical personnel for service in the Armed Forces is a matter of paramount concern to their administrative heads. While it is the administrative medical heads to whom reference is made, the top Line echelons of the services, along with the members of their secretariats, would take the initiative and demand of Congress that ways and means be found to provide adequate medical coverage for personnel in uniform, if it appeared that the medical directors and operational planners were unable to cope with the situation.

Any system fraught with uncertainty or with the quality of hit-or-miss is unacceptably faulty and cannot be countenanced by those responsible for military planning. The Armed Services medical department should not have to wonder where or how they will obtain a sufficient number of medical and dental officers and nurses to meet their needs any more than the Ordnance Department would wonder about the source of supply for a sufficient number of gunners or the Bureau of Ships over a sufficient number of personnel to man and fight the vessels of the Navy.

From the close of World War II up until September 9, 1950 (the date Public Law 779, 81st Congress, the doctors' draft law, went into effect), the Medical Department of the Navy (and undoubtedly a similar situation has existed in the Army and Air Force) had no assurance that an adequate supply of medical and dental officers would be available. Until the passage of the doctor's draft law, our planning had been fraught with distinct uncertainty. Reliance for any significant number of dentists and medical men has depended upon a succession of pump priming or stopgap devices—a succession, as has been said, of expedients. From the outline of some salient factors and figures given on the page opposite, we see that only 4,778 of 11,176 who started the pro-

gram actually were available. On May 29, 1946, the Secretary of the Navy issued an order to hold 2,000 of the above on active duty.

In 1947 Public Law 365 was enacted. Title II of that law provided for appointments in the regular Medical Corps at advanced rank on the basis of professional age and experience. Sixty-two physicians have been commissioned in the Regular Corps under this authority. Separation from the service except for physical and other statutory reasons was discontinued. The retention of retired officers on active duty was permitted.

In December 1948, the American Medical Association addressed a letter to each of 7,610 doctors in the United States who were then less than 26 years of age urging them to volunteer for active duty. Special reference was made to those who had received all or part of their medical education under the Navy College Training Program or the Army Specialized Training Program. The letters pointed out their liability for induction under the Selective Service Act passed earlier that year and gave other pertinent information. Cards were enclosed for the recipient to fill out and return to the A. M. A. They, in turn, forwarded the cards to the Surgeon General of the appropriate Armed Service. The Bureau of Medicine and Surgery addressed a letter to each of the doctors from whom a card was received and gave complete information on how and where to apply for a commission and active duty. To those not holding commissions in the Medical Corps Reserve, the Bureau of Medicine and Surgery prepared an application letter, including a franked envelope addressed to the nearest Office of Naval Officer Procurement. To obtain the application forms all that was necessary on the part of the recipient was to sign and mail the letter. A copy of the Bureau letter to each of these young doctors was sent to our District Medical Officers and the appropriate officer-in-charge of Naval Officer Procurement in order that they might contact each doctor and assist him in every possible way. Only 33 medical officers out of 7,610 receiving the letter came on active duty for a period of two years as a result of this program.

In February 1949, the Secretary of Defense inaugurated a "moral suasion" program directed to those who had received V-12 or ASTP training and who had not subsequently served on active duty. Letters and telegrams were sent to approximately 11,000 physicians and dentists; 8,681 replies were received. In response to this appeal, 583 physicians and dentists (5.5 percent of those contacted) volunteered for active duty for a period of 24 months in either of the three Armed Services. Of that total, 192 medical officers volunteered for duty with the Navy.

In 1950, Public Law 779, the doctors' draft law, was enacted.

In spite of the above-mentioned efforts, the Regular Navy Medical Corps has suffered a 25.6 percent reduction in strength during the past eight years, a net loss of 503 members from a strength of 1,961 on July 1, 1945 to 1,458 on July 1, 1953. While the Navy has not resorted to Selective Service for any physicians, but for the stimulus of the draft law its medical officer shortage would long ago have become intolerable.

In an effort to make the service more attractive and encourage all categories of medical department personnel to volunteer for service, a number and a variety of measures have been instituted. For this discussion account will be taken only of the measures that have been implemented in the interest of attracting a larger number of physicians and dentists to serve with the Armed Forces for a limited period or as a career. Some of the more important of these measures which are still in effect may be listed as follows:

1. Improvement of the medical intern program and the inauguration of a dental intern program.

2. The establishment of a residency training program.

3. Liberalization of the postgraduate training program in (1) naval hospitals, (2) civilian hospitals.

4. Short-term training in military medical specialties.

5. Special courses in the various specialties in civilian institutions.

6. Extra compensation of $100 per month.

7. Discontinuation of professional examination for appointment.

A number of other inducements have been offered but abandoned. One inducement was the privilege of accepting a commission while completing a residency of one, two, or three years in civilian hospitals with full pay. A similar policy at one time affected internships being served in civilian hospitals.

The doctrine of the service as an honorable way of life has, moreover, been consistently proclaimed through one medium or another, from one source or another. It has been held that this way of life is one that, along with many signal and unique attractions, carries with it a pay scale by which beginners with dependents may realize a yearly income of $6,017.28, with the prospect of promotion (practically all of the deserving are promoted) through the ranks of lieutenant at an annual salary of $7,273.92, of lieutenant commander at an annual salary of $8,724.00, and of commander at a salary of $9,640.56, to that of captain in about 16 years at an annual salary of $10,707.60 increased to $12,130.32 at the end of 30 years service, and with

a fair chance of attaining the rank of rear admiral in from 22 to 25 years at a yearly salary of $14,852.64. The mean net annual incomes of civilian physicians in the years 1949, 1950 and 1951 were $11,058, $11,538 and $12,518, respectively. While these earnings may appear to be in excess of the average pay realizable by service doctors, the cold fact has been repeatedly cited that before the civilian can make a cent for himself it is necessary for him to obtain from his patients enough money to pay the office rent, pay the nurse, pay the stenographer, pay his public relations club bills where he must put in an appearance and show evidence of his material well being, and pay the installments on his home, as well perhaps as upon his car. The fact that a career in the service presents a means of enjoying comfortable residence both at home and abroad interspersed with periods of wide travel and residence in foreign lands under conditions of exceptional circumstance and dignity in the far-flung reaches of the world and at an early age that would make it possible for individuals to enjoy their experiences in retrospect for a long time, has been pointed out. And finally, that this way of life holds out the prospect of years of contented retirement and provides, through medical care, hospitalization, and retired pay, a safeguard against one's ever becoming a burden to himself, his family, his relatives, or his friends, has, moreover, been emphasized.

The results of these endeavors and many others have fallen far short of their objectives and have failed to obviate the necessity for the enactment and reenactment of a doctors' draft law (now Public Law 84, 83rd Congress).

The purpose of this treatise is not to point to the past except to provide a clearer concept, nor to cite a cause for our ills except to aid in the development of a remedy. The purpose of this presentation is to propose consideration of certain measures believed to be in order and urgently needed, and to suggest a choice of these measures as the most feasible approach to a problem with which the medical services of the Armed Forces have been confronted for the past eight years.

A view that our difficulties would vanish under either an all-out war or the economic squeeze of a depression has been advanced. Its validity is not doubted. However, a plan which depends upon calamity for its *modus operandi* should be abhorred.

The ideal solution to this whole problem could be realized through circumstances under which civilian and military medicine might work out a cooperative plan that would satisfy all interested agents and agencies. This could be realized only if it were possible for the Association of American Medical Colleges and the American Medical Association, along with the American

Dental Association and American Association of Dental Schools, to control the production and distribution of the physicians and dentists in America and thus guarantee an adequate supply to the Armed Services. In the light of past experience the realization of such an ideal seems unlikely unless the draft law continues.

The Draft Act *per se* is not an altogether objectionable device. To be sure, it relieves the individual of the responsibility for making up his own mind and initiating his own acts. There is a certain element of fairness to those concerned under the draft law. Under the Draft Act an individual becomes a pawn waiting for an extraneous force to move him. Under this system when State and National Advisory Committees to Selective Service function, the military avoids the unpleasant accusations of being ruthless, extravagant, and inconsiderate of civilian needs.

Aside from the idea that the services deprive communities of doctors, civilian groups occasionally lose sight of the fact that the Armed Services belong to them. Some of the local citizenry think of the service as a oneway proposition. It is little short of amazing that they frequently fail to consider the fact that their local doctor will return to them, unless some unforeseen circumstance supervenes. Moreover, he will return a more valuable doctor because he has been in the service. In the event of a variety of disasters, the special training available in the Armed Services would stand the local doctor, and his community, in good stead.

On the other hand, the odium or opprobrium inherent in the necessity for the Government to point its finger at a particular group of citizens in a democratic country to induce its members to render a service ordinarily expected is not mitigated. Neither does such an arrangement promise to end the bickering between civilian and military representatives over what constitutes an adequate supply and how the military should employ its doctors. It would appear worthy of mention that by 1955 the prospect seems good of obtaining a sufficient number of physicians and dentists to meet the needs of the Armed Services through the simple instrumentality of the Selective Service System, as currently operative, irrespective of a doctors' draft law. The reason for this is that a large percentage of those who have comprised the output of graduates from the medical schools of the Nation during recent years have been veterans and were therefore exempt from Selective Service.

Age and motivation are two objections to a draft law as an instrument for the procurement of physicians and dentists. It is possible, even probable, that some doctors would welcome being drafted into the service; the majority of those drafted, however, put on a uniform with reluctance, accept the ordeal as a sentence

to be served. They carry out their work in an unhappy frame of mind.

In the military, ever since Cain killed Abel, the accent has always been on youth and vigor. Efforts to disregard this dictum are sure to lead to difficulty. The services need young individuals with versatility, adaptability, resiliency, and a lot of "zing." A plan where older individuals of limited physical ability could staff stateside hospitals and fill the so-called "cush" billets ashore, while the young and agile carry on where the going is grim and gory, is shortsighted and unrealistic. This would constitute something of a paradox. Under such a system those deserving an award would have levied upon them a double penalty through a denial of a desirable duty assignment on the one hand and restriction to arduous and hazardous duty on the other.

The services need individuals who are all-season and all-weather performers capable of carrying the ball under all circumstances and of rotating from sea to shore or from shore to the theatre of combat. Adherence to that practice is essential to the maintenance of good morale in the service.

Particular emphasis is placed upon this point in view of a recent tendency to spotlight an older age group, which has seen little or no actual military service, albeit in many instances due to no fault of its own. To force middle-aged and inexperienced doctors into the military service would be certain to introduce complicating features that would be embarassing to both the service and the individual. This objection could be eliminated through appropriate language in the law. Nevertheless, as long as a draft law might be in effect, there would always be the temptation, or even invitation, to overextend its application.

There is another fundamental fault with the draft system as it has been operated. The currently required two-year period of service is too short and forces frequent moves and a consequent reduction in the doctor's actual on-the-job time—a major objection to the individual serving and to those who must manipulate their forces to meet the medical demands which confront them. A two-and-one-half or three-year period would be much better than two. Thus, it would be possible to realize two years of effective service from an inductee. Now six months to one year may be absorbed in orientation procedures and transfer to and from a foreign station.

To avoid the evils of short hitches, the Bureau of Medicine and Surgery of the Navy has recently introduced a proposal for a short term, four-year, regular commission under which the doctor would be guaranteed his release at the end of four years. He may be offered the option of remaining for three additional years in return for residency training and other premiums. This kind of

provision would, moreover, eliminate probably the most major objection against volunteering for the service, *i. e.*, a native rebellion against being locked up or fenced in. A similar system is presently in operation in Great Britain's Royal Navy. This system was recently placed in effect in the U. S. Navy. The response to date has been disappointing.

While it has been emphasized that youthful vigor and stamina are essential attributes to a successful and profitable service with the Armed Forces, sight should never be lost of the fact that any attempt to operate a service medical department by relying solely upon a *modus operandi* of short-term rotation of doctors from civilian life to service and back again to civilian life would be doomed to failure. The maintenance of a substantial basic structure of regular career officers is indispensable to the implementation of the system that has satisfactorily stood the test of time.

During the past several years military medical administrators have heard a great deal about what is wrong with them, their management methods and their organizations. It is generally agreed in the services that disproportionate emphasis has been placed upon certain activities and practices of service medicine. Whether the administrative heads of the Armed Services' medical departments have demonstrated their ability to manage efficiently and effectively is debatable, but these service administrators must think that they have not done too badly. They are mindful and appreciative of the role played by their civilian components, consultants and technical advisers, and their Reserve cohorts, in the attainment of their excellent record. However, in the last analysis they consider themselves professionals and singularly capable of judging in many areas where only years of experience could qualify one to judge. These military medical administrators will admit a great wastage of medical manpower during the late war, as there was of every other resource, but they will not admit that it was altogether their fault. They contend that quality and competence are usually reckoned in terms of certain more or less conventional criteria regardless of whether it is an organization or a race horse that is being judged. As with a race horse, one important criterion is performance. The record speaks well of the performance of their respective organizations.

These medical administrators agree that is is possible to look forward intelligently only if one looks backward too. The advantages of hindsight over foresight are well appreciated. The backward viewing critics should not forget that while many instances may be cited in which much energy and resources went for naught in the past, nevertheless those responsible for such expenditure could well have been regarded as negligent had they not made provision for which they were later criticized. A classical

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illustration during World War II was the provision of a naval hospital at Netley in England. As it ultimately turned out, maybe this hospital was never critically needed. Between June and September of 1944, 8,076 patients, of which 4,222 were battle casualties, were admitted and treated there. For this service, the hospital, known as Navy Base Hospital No. 12, received a Navy Unit Citation and Commendation. If instead of a success, the Normandy invasion had developed into a stalemate, with many times the casualties, and no provisions for handling the casualties had been made in advance, it is probable that adverse criticism would have resulted and very likely from the same sources from which criticism of wastefulness emanated.

Hope in the minds of medical military planners of their ever realizing a satisfactory solution to their personnel problems through simple negotiation and mutual give and take on the part of existing agencies is rather forlorn. It behooves them to look for new means or devices. The question narrows itself down to a choice between two alternatives: (1) the adoption of a scholarship plan, (2) the establishment of a Government-supported school.

The less desirable of these possibilities, according to most doctors, is a service medical school. During the past several years this matter has been aired upon a number of occasions. Congressman Louis B. Heller of New York, in fact, introduced a bill in the 81st and 82nd Congresses and reintroduced a similar bill in the 83rd Congress proposing the establishment of a Federal medical and dental school.

While there may be a few doctors in the service who would advocate establishment of such a school, it is believed that the majority of service doctors would oppose it. Their opposition would be based first upon their aversion to "socialized medicine." It would be contended that such a school would be a gigantic step in the direction of the socialization of all medical establishments and medical care throughout the Nation. Whether this is true or not is debatable. There is little question that the school would be an expensive method of obtaining service physicians and dentists. This idea may be founded upon bases more apparent than real. The continuing need for the school's operation and supply of doctors is another matter about which serious doubt exists. If a plan that could be turned on and off or slowed down and speeded up to meet the exigencies of a given period is desired, that would argue against a school.

On the other side of the ledger there are a number of arguments that can be advanced to support the idea of a school. The establishment of a service medical school would eliminate the need for the doctors' draft law. A school or schools for training service physicians, dentists, nurses, et cetera, would eliminate the

necessity of the medical services' having to account to various extra-service agencies for the manner in which their personnel are utilized.

The ratio of medical department personnel to troop strength is established by law. According to Public Law 381, 80th Congress, the Navy is allowed six-and-one-half doctors per thousand, two dentists per thousand, and six nurses per thousand, but insofar as these three corps are concerned, the legal limit has never been reached, even in time of war.

Currently, the ratio of physicians per thousand in the Navy is 4.0. This ratio during the past six years has varied between 6.1 and 3.9, with an average of 5.1. The number of physicians necessary to meet the Navy's need is determined by individual activity analysis of medical department workload by representatives of the medical department together with Line officers of the Bureau of Naval Personnel and the Office of the Chief of Naval Operations. This figure is based upon careful and considered planning and is by no means a trumped-up quantity.

There are several principles to the much mulled over ratio that cannot be overemphasized. The first is that a ratio is unrealistic for determination of need. To set a ratio and say that the medical services of the Armed Forces must live with it is equivalent to saying that requirements should be determined by guess rather than by computation. To estimate the crew allowance for airplanes on the basis of a ratio per total number of planes would result in a ridiculously haphazard manning of planes. The only realistic attitude that may be assumed relative to a ratio is first to determine a need by a conventional and rational process. From that need a ratio may be deduced. Then a ratio is what it should be—a statistic—an end result and not a determinant.

Another point about ratios that has been contested time and again is that what may be an adequate ratio for the Army generally is not adequate for the Navy. The Navy, operating in a wider variety of media and staffing a greater number of small units, including ships, of course, is consequently more broken up and therefore may require more doctors per given number of troops than would be the case if that same number were a part of an Army division. To apply a common denominator and expect the same ratio to be applicable to all the services alike is to deal theoretically with a situation which requires practical treatment.

Furthermore, ratios do not remain constant, but fluctuate from month to month, depending upon personnel turnover, in one determining area or the other, *i. e.*, on the medical or troop side of the ledger.

The term "troop strength" is frequently interpreted literally when its implication is distinctly liberal. To be explicit, troop strength, as envisioned by Congress, includes:

". . . the total authorized number of commissioned officers of the Navy and Marine Corps (exclusive of commissioned warrant officers), the total authorized number of enlisted men of the Navy and Marine Corps, the total authorized number of midshipmen at the Naval Academy, the actual number of commissioned warrant officers, and warrant officers on the active list of the Navy and Marine Corps, and the actual number of midshipmen on active duty for flight training . . ."

Many believe that a Government-sponsored medical school would create a caste or class distinction among doctors. Those trained by the service school would, according to the views of some, have a stilted attitude and a similar brand of medical education. On that basis, the advantages which are thought to stem from a mixture of types, a mingling of ideas, and a variety of teachers, and which are realized by drawing doctors into the military service from widely distributed medical schools, would be lost under a military or naval medical academy system.

Would the products of a Government-operated school be a sort of hackneyed, stereotyped, or provincially educated group? While the idea is narrow in its nature, the possibility could be eliminated by special courses in civilian schools. Also, whatever benefits are supposed to accrue from this mixture of finished product from hither and yon will still be realizable, since the men and women who receive their medical, dental, or nurse training in Government institutions or under Government subsidy will have had their academic training in a variety of widely separated schools. The continued admission into the services of acceptable graduates from the medical schools of the nation at large would provide, in great measure, the highly desirable hybrid vigor that is sought and expected from cross-pollination or transfusion of ideas and philosophies.

To refute those who would look askance at the Government controlling what it subsidizes, the advocates of a school can contend that Government control is better than no control. There is little indication that organized civilian medicine has any appreciable control of its members. The question also may be asked: What is so bad about Government control? This question may be supported by the enjoinder to witness the Post Office system. Although that system is not perfect, certainly its performance is quite creditable. Has anyone ever witnessed a walkout or strike or foot dragging on the part of its employees? Whenever a national institution or service under the control of a special civilian element is unable to supply an essential need, what is more natural than for the people to turn to their Government for a correction of the situation? The Government did take

over and deliver the goods when it enacted and reenacted the doctors' draft law.

The creation of a medical West Point or Annapolis, or a combination of the two, could bring an end to the recurring contention that the services are ruthless in their drain upon civilian medical personnel and that as a result of service extravagance the civilian population suffers.

There are two schools of thought about whether the existing facilities are turning out an adequate number of physicians and dentists to meet civilian and military needs. Based upon the commotion in some localities after the application of Public Law 779, one cannot escape the impression that doctors are in distinctly short supply in many areas and are nonexistent in others. Whether or not the output is sufficient, it is a rather weak argument to explain the apparent shortage of terms in a maldistribution of doctors. That may be an explanation but it is not a justification. Some good candidates for admission to medical schools are denied the privilege of studying medicine because of the Nation's limited training facilities. The creation of a government school would allow many of these young men and women to study medicine. That school could feed into the civilian economy a number of well and specially trained doctors.

A government school as a source of doctor supply would stop debate about the extent that the military should provide medical coverage for dependents of its personnel. If the Armed Services are not accused of depriving civilian communities of badly needed doctors, and in turn using these doctors to treat dependents of service personnel, a score about which there has been much "to-do" will be settled.

If curtailment, or even abolition, of dependent care would eliminate the need for a doctors' draft law, the services would agree that dependent care reduction or even abandonment of dependent care might be justified. But the idea that this would be possible is argued by no one, because the total number of doctors employed in the care of dependents is not great enough to make the difference. The Navy takes care of its dependents in accordance with a clear-cut existing law. There is nothing "phony" about it. It is moreover plainly implied in the deliberations of the various committees, including Congressional committees, which have studied formulation of an equitable pay scale for the services, that dependent care by service doctors at a special rate of charge would be continued. The latest expression of opinion upon this score was reflected in no uncertain terms in a report submitted in June 1953, by a Citizens Advisory Commission to study medical care for dependents of military personnel appointed by the Secretary of Defense with Dr. Harold G.

Moulton, President Emeritus of Brookings Institution, as chairman. Inpatient care is not free to those eligible. The Navy has no choice except to abide by the law. It is a Medical Department axiom that no form of medical care is as good as it should be if it is not as good as it can be.

Even with the medical coverage currently provided to dependents, a high percentage of the enlisted personnel whose dependents require hospitalization seek aid from the Navy Relief Society to defray expenses. That the services should take care of their own people appears to be no more than natural and desirable. As a class, service dependents are a worthy and courageous lot. They are frequently called upon to endure hardships and anxieties of a most trying character peculiar to service life, in peace as well as in war. Those upon whom they depend are engaged in the all-important mission of protecting America from forces that would destroy her. For that service their remuneration is modest indeed. There is no condition or circumstance more contributory to the morale of Armed Service personnel during their absence from home than the knowledge that their dependents will receive adequate medical care.

The morale factor inherent in dependent care and upon which so much stress is laid is not confined to the dependents and to those depended upon, but also extends to the doctors providing the care. The majority of doctors engaged in the practice of obstetrics and gynecology or of pediatrics in the services are happy, and restricting or discontinuing such care would be as detrimental to the morale of that category of doctors as to those in need of their services.

It should be borne in mind that no objection has been raised about service-provided care to dependents at overseas bases and isolated stations. To be able to provide an acceptable quality of dependent care overseas, the military contends that the doctors providing that care must be specialists. In order for them to remain competent and contented, the practice of their specialty must not be restricted to overseas and foreign stations.

An independent source for doctor supply, it can be held, should go a long way towards eliminating the seemingly endless number of inquiries, investigations, and analyses to which the medical departments of the Armed Services have been subjected during the past seven or eight years. This period has literally been one in which the Monday-morning quarterbacks, the reformers, and the so-called curious crusaders have had a real heyday in Washington. For a considerable period these investigations were welcomed because it was felt that they would be helpful, and while the services were proud of their organizations and were glad for outsiders to become better acquainted with

them and were glad of their opportunity to become better acquainted with outsiders, these investigations have continued to require the expenditure of an appalling number of man-hours and the documentation of much testimony and statistical data. It will not be denied that appreciable benefit has accrued from some of these surveys. By a similar token, there have been a number in which the good that came of them was never apparent.

Some corrections held to be realizable through a school would be similarly realizable by the adoption of a scholarship plan. Under either plan the services would be provided with properly motivated medical and dental officers. Proper motivation is a factor which it is impossible to exaggerate. The service doctor needs to be of a special breed. Service medicine is a specialty *sui generis*. A doctor specifically trained for the service would scarcely complain about inspecting latrines, or mess gear sterilizing apparatus, or running milk analyses. These are logical views. The service doctor must be an inordinately versatile and adaptable individual. If one is unable or unwilling to comply with the requirements peculiar to the service, he may be compared to a baseball player who is extremely proficient as a batter and a runner, but cannot field and throw the ball. His value is reduced fifty percent. He does not qualify for the team.

Like the school idea, the scholarship idea for supplying Navy doctors is not new either. In 1948, a Navy-formulated plan was presented to the Association of American Medical Colleges before its annual meeting at White Sulphur Springs, West Virginia. The salient features of this plan were:

1. Scholarships would be provided by contracts with accredited educational institutions offering approved undergraduate courses in medical or dental science.

2. All educational expenses were to have been paid plus $75.00 per month as a retainer fee to each beneficiary.

3. The plan called for obligated service on the basis of one year of active duty for each year of scholastic training at Government expense.

4. No scholarship graduate was to have been eligible for residency or specialty training until he had completed an appointment in the regular service unless he agreed to extend his period of obligated service by the amount of time spent in residency or specialty training.

This plan was received by the members of the Executive Committee of the A. A. M. C. with sufficient interest to prompt its submittal by the Committee to the deans of all the medical schools in the country. They were requested to express their reaction to the proposal and indicate how many additional medical

students their facilities might be stretched to accommodate. The reception to this plan throughout the country ranged all the way from enthusiasm to complete indifference. The over-all response can be said to have been little more than cool. Inadequacies of one kind or another, including lack of laboratory space and clinical material, were claimed in most cases. In any event, steps were taken to obtain legislation to carry out this plan. The bill died in committee.

Following the Navy's lack of success in its scholarship ventures, the Army formulated a scholarship plan. Theirs differed from the Navy's chiefly in the amount of dollar benefit the medical schools would realize through it. This plan is still a live issue and will probably reach the Congress at some future date.

There are many points in favor of a scholarship plan as a system of medical and dental officer procurement. It would carry with it the expressly desirable quality of providing for undergraduate training in already existing medical schools. It would preserve intact the advantage that accrues from an intermingling of the ideas and teaching methods of a variety of institutions. It would further a close relationship between civilian and service medicine and maintain a state of awareness among civilians that the interests of the Armed Services are their interests. Most important of all, in the estimation of some, it would pre-empt the creation of a government-sponsored and operated medical school.

The scholarship plan, even in the most expensive form yet considered, would be much more economical than establishing a school. This estimate will be challenged when the question of school versus scholarship reaches the arena of debate and is subjected to the analytical scrutiny of experts. Undoubtedly some will advance the view that the validity of the economy-contention is subject to various elements of reasoning. First, whether a long-range or short-range program is envisioned would make a difference. The longer the life of the school, for instance, the more would the balance be tipped in its favor, since its initial cost would be a major budgetary item. Secondly, whether the contemplated school would supply physicians and dentists to the Armed Services only or if, as in the Heller Bill, referred to earlier in this treatise, the school would train physicians and dentists for the other Federal Services requiring medical men, certainly would be significant. The broader the purpose of the school the more readily might it be justified dollarwise but, by a similar token, it would be more criticized on grounds of socialization. Of course if a scholarship system is adopted for medical and dental officers, other Federal agencies, such as the Public Health Service, the Indian Service, and the Veterans Administration, might seek to be included in the program. Thus the economic

factor of the school is given a decided boost, but, on the other hand, an extension of the scholarship program to include the training of doctors for all Federal Agencies would introduce a situation in league with socialized medicine. Still another facet is involved. Would the administrators of the nation's medical schools remain insusceptible to temptation? It may be perfectly true that it would cost less to subsidize medical education of students than to create and staff a medical school, but the tendency would be present for the medical schools to become more and more receptive, if not solicitous, of Government aid, until the Government could be subsidizing 70 medical schools rather than one. While organized civilian medicine and medical schools may regard Government subsidy as a vice to be abhorred, there is always the possibility that such a vice may ultimately come to be embraced. A significant advantage with a scholarship plan would be that it could be turned on and off to meet the needs of the services, depending upon expansion and contraction, and upon the popular appeal of the services as determined by the civilian economy.

It has been found from actual experience that the needs of the Navy can be best met if two thirds of the Medical Corps are members of the Regular Navy and one third are Reserves. Currently, this ratio is exactly reversed. As of July 31, 1953 there were 5,854 doctors in the Medical Corps of the Army, 4,202 in the Navy and 3,452 in the Air Force for a total of 13,508. The number of regular medical officers now serving in the military departments is 3,951. The services therefore fall more than 5,000 officers short of the two thirds ratio. If present methods of procurement are sufficient to provide for normal attrition, which is estimated at six percent per year, a long-range plan to procure more than 5,000 medical officers and thereby maintain a combined regular corps for the three services of 9,333 is necessary. To avoid a hump in promotion and permit readjustments to possible future changes in overall strength, it is desirable that officers be brought into the regular service over a period of from five to ten years. If the shortage is to be made up during a period of five years, an enrollment of about 1,100 medical officers per year is required. This represents an average of 16 graduates from each medical school per year. If the shortage is to be made up during a ten-year period about 550 officers per year would be required. This would call for eight graduates per school per year. This would have to come from the civilian economy unless eight scholarship-subsidized graduates could be provided by each existing medical school annually under an existing scholarship plan.

It should be emphasized that after the Medical Corps has been brought to full strength, an annual input of eight officers from

each school will be necessary if the annual attrition rate continues at approximately six percent. This would be approximately eight percent of the annual crop of medical school graduates. It is possible that the attrition rate could be counteracted by the number of non-scholarship trained doctors who might elect to enter the military services. In any event, the restoration of the erstwhile ratio of two thirds Regulars to one third Reserves would, with specific reference to the Navy at least, be desirable. Civilian medical agents or agencies can accomplish little that would be more helpful than to effect the acceptance of a military medical career by an increased number of doctors.

Objections that may be advanced against a scholarship plan would include opposition to the Government's gaining control through subsidy. The same hypothetical reply that has been suggested concerning the school's potentiality would apply to the scholarship, *i. e.*, government control is better than no control. There might be differences of opinion as to who would choose candidates for medical training under the scholarship plan. That should not be a major obstacle. It would seem logical that insofar as the intellectual qualities of candidates are concerned, the medical school officials should be the sole judges, but for physical qualifications and an estimate of proper motivation and service aptitude, Armed Forces representatives would be better qualified to judge.

For a long time there has been a sort of barrier between service and civilian medical devotees. This came about more or less through a natural set of circumstances, and while it did not appear to make much difference, the situation nevertheless has been short of being as healthy as is desired. Since the advent of new methods and new concepts of warfare which promise to involve civilian populations in furure conflicts directly, there has been a closer intermingling of civilian and service doctors. While there is no question that this barrier has been lowered, through the instrumentality of a common cause, it has not been abolished entirely.

Possibly this insouciant attitude towards the services goes directly back to the medical schools (some of which appear to be frozen in the ice of their own self-sufficiency or their material limitation of facilities) and to the influence of certain individuals who are not sympathetic with Emerson that "Our culture. . .must not omit the arming of the man." One unsympathetic professor can do more to instill misgivings into the minds of young doctors than all of the friendly gestures possible on the part of the military can offset. For a military scholarship system to operate satisfactorily, service trainees must be accepted on an identical basis and subject to the same attitude as are all other students.

The establishment of a scholarship system should bring service and civilian medicine closer together and make for a warmly cordial rapport. Resort to a government school could accentuate two factions between which a barrier might be raised. It seems reasonable to hope and expect that a mutually beneficial relationship between the nation's medical schools and the Armed Services will accrue through the Medical Education for National Defense or MEND program. MEND pilot programs are currently in force at five of our leading medical schools.

With the help and guidance of the representatives of organized civilian medicine and dentistry, combined with the legislative support the Armed Services have been wont to receive from Congress in the past, it is believed that a sensible and realistic approach to the personnel problems that confront the medical departments is possible. Through such cooperation, a satisfactory solution must be amicably and expeditiously realized.

The burden of the theme of this offering has been that due account be taken of a priceless resource, particularly as pertains to the provision of professional personnel requisite to its preservation and restoration. That the time is high for forthright and conclusive action has been stressed. The advantages and disadvantages inherent in possible courses of action have been outlined.

The health of our military men and women is all important. Trained doctors in adequate numbers to protect service personnel from illness and injury and to treat these entities when they arise are necessary. Too few doctors, now, are willing to volunteer for military medical service.

Some adequate solution to this situation must be found. . .soon.

Multiple Sclerosis and the Future

I am appalled by the magnitude of the problem of multiple sclerosis and the extent of work yet to be done, but when I think of other diseases which medicine has conquered, I am not discouraged. We all know that it is now difficult to show medical students examples of many diseases which were once epidemic and ravished whole populations. If we are diligent, aware of possibilities, and fortunate, the day may come when multiple sclerosis is as rare.

—HAROLD R. WAINERDI, M. D.
in *Medical Annals of the District of Columbia*, p. 14, Jan. 1954

Plaque Presented to Medical Center in Honor of Late Col. Holloran

Dr. Winfred Overholser, right, Superintendent of St. Elizabeth's Hospital, Washington, D. C., is shown in recent ceremonies at Walter Reed Army Medical Center unveiling a bronze plaque in honor of the late Colonel Roy D. Halloran, MC, USA, in the presence of Major General Leonard D. Heaton, MC, USA, Commanding General of the Center, and Colonel Halloran's son, Donald, Washington, and daughter, Mrs. Franklin Navarro, Houston, Tex.

The plaque, which was the gift of the American Psychiatric Association, bears the inscription: "as a result of his unceasing efforts psychiatry gained a status equal to that of medicine and surgery in the United States Army Medical Service." Colonel Halloran was chief of psychiatry in the Office of the Surgeon General, U. S. Army, during World War II. He died on 10 November 1943.

At the same ceremony Major General George E. Armstrong, Surgeon General of the Army, posthumously awarded the Certificate of Achievement to Colonel Halloran.

THE MEDICAL ESTIMATE

SPURGEON H. NEEL, *Lieutenant Colonel, MC, USA*

EVERY medical officer, whether he supervises the medical service of an infantry battalion or that of a theater of operations, must make an intelligent estimate of the military and medical situation before he can select the best course of action in support of his commander's mission. There is no difference in the principles involved in planning good medical service for a small unit in the zone of interior than in developing the medical plan for a major command in contact with the enemy. The only differences are the detail involved and the manner in which the estimate is used. Good medical service must be planned and based on sound estimates. There is no alternative.

The estimate of the situation may be defined as a logical and orderly examination of all of the factors affecting the accomplishment of the mission to determine the most suitable course of action. The outline for the commander's estimate of the situation has been standardized by the Joint Chiefs of Staff for use by all components of the armed services. Its purpose is to provide an orderly arrangement of the material contained therein to minimize the possibility of omitting matters of importance, and is designed to facilitate straight and clear thinking in arriving at a sound decision.

THE OUTLINE

The outline for the medical estimate as presented in this article is developed from the same sources of information used for the commander's estimate, and its standards parallel the latter in clearness and brevity. There is, however, no standard outline prescribed for the medical estimate as there is in the case of the commander's estimate of the situation. Therefore the recommended outline (form 1) follows both the commander's and the logistic estimate, and facilitates concurrent preparation. It is used in instruction at this school, and has served as an effective check list when considering the various factors affecting field medical service.

An estimate is an intensely personal matter and each surgeon goes about it in a slightly different way. The recommended out-

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line is not intended to regiment or complicate the thought processes of individual surgeons and it gives more details than the average surgeon will have time or need to consider. A running estimate of the situation, revised as events transpire, is the rule in the field. It must always be remembered that the formal estimate is a means, not an end, and that a logical course of action must never be sacrificed in favor of a prescribed course of action.

Form 1. Outline of the medical estimate

(CLASSIFICATION)

Med Sec_____
Location
Date and time

1. MISSION (the specific medical support mission)

2. SITUATION AND CONSIDERATIONS (factors affecting medical service)

a. Characteristics of the area of operations
   (1) Terrain
   (2) Climate and weather
   (3) Civilian population
   (4) Flora and fauna
   (5) Local resources

b. Enemy situation
   (1) Strength and dispositions
   (2) Combat efficiency
   (3) Capabilities
   (4) State of logistics
   (5) State of health
   (6) Weapons

c. Friendly situation
   (1) Strength and dispositions
   (2) Combat efficiency
   (3) Plan of action
   (4) State of logistics
   (5) Weapons

d. Strengths to be supported (normally a table)
   (1) Army
   (2) Navy
   (3) Air Force
   (4) Allied
   (5) Prisoners of war
   (6) Civilians
   (7) Others, including partisans

e. Physical condition of the command
   (1) Origin of troops
   (2) Presence of disease
   (3) Status of immunizations
   (4) Status of nutrition
   (5) Clothing and equipment
   (6) Fatigue
   (7) Morale
   (8) Other as indicated

f. Assumptions (those necessary for completing the estimate)

g. Special factors (items of special importance in the particular operation under consideration)

3. MEDICAL ANALYSIS

a. Casualty estimates (rates and numbers by type units)
   (1) Number of casualties
   (2) Distribution in time
   (3) Distribution in space
   (4) Areas of casualty density
   (5) Lines of drift or evacuation

b. Medical requirements (estimate of requirements)
   (1) Medical supply
   (2) Hospitalization
   (3) Evacuation
   (4) Service
   (5) Preventive medicine
   (6) Other

c. Medical means available
   (1) Organic medical units
   (2) Attached medical units
   (3) Supporting medical units
   (4) Civil public health
   (5) POW medical personnel
   (6) The medical troops ceiling

d. Medical courses of action (list of policies and procedures which will accomplish the medical mission)

4. MEDICAL EVALUATION

a. Outstanding medical elements and controlling limiting features

b. Comparison of relative advantages and disadvantages of each medical course of action available

5. CONCLUSIONS

a. Can the commander's mission be supported medically?

b. Which course of action will best and most economically support the commander's mission?

c. What major medical features should be brought to the attention of the commander?

d. Outline unavoidable medical limitations or deficiencies.

_____

Surgeon

(CLASSIFICATION)

NOTE: When the commander is considering several possible courses of action, a separate medical estimate may be necessary for each proposal. Within the combat zone, the entire medical estimate will seldom be reduced to written form. Rather it will serve as a check list to preclude errors of omission.

MISSION

Broadly speaking, the mission of all medical units is to provide medical service to the troops which they support. The mission of the tactical commander determines the medical requirements to be met by the medical service and the procedures by

which these requirements will best be satisfied. A clear statement of the type of tactical operation to be supported must be included, such as, "To render medical support to the ___ Infantry Division in an assault on a fortified position." If several categories of personnel are to receive varying types or degrees of medical service, such should be mentioned in the concise statement of the medical mission.

SITUATION AND CONSIDERATIONS

Characteristics of the area. Various items of medical intelligence affecting the medical service of the particular operation are enumerated. An estimate is only as good as the information on which it is based and the surgeon must exhaust every potential information source as far as time and circumstances will permit.

For example, terrain has the same bearing on medical planning as it does on tactical planning and directly influences the incidence and location of casualties. The availability of roads, landing strips, railroads, and harbors will influence the type of evacuation planned. Whenever possible, the surgeon or his representative should make a personal reconnaissance over the terrain on which the battle will be fought.

Climate and weather also contribute to the incidence of casualties. Frostbite, snow blindness, trench foot, sunburn, or heat exhaustion all affect the requirements for medical facilities and means of evacuation. The speed at which drugs and medical equipment deteriorate is related to climatic conditions, and storage facilities must be estimated accordingly.

Civilian sources may spread disease to the command, and medical assistance requirements for civil affairs and military government operations must be anticipated; therefore a consideration of the methods and organization of local public health agencies is important.

Because insects, animals, and vegetation may possibly affect the health of the command, troops must be oriented and other safeguards taken against these agents. Insects can be particularly troublesome, and detailed information regarding their types, numbers, distribution, habits, et cetera, is essential.

Local resources, especially food and water, are of importance to the surgeon. While other agencies are responsible for procurement, the sanitary supervision of food and water from sources to consumers is the responsibility of the medical service. The availability of acceptable medical supplies within the area may permit a reduction in medical supply procurement requirements.

Enemy situation. The surgeon is particularly interested in the enemy's ability to cause casualties and to prevent their evacuation. The presence of contagious disease among the enemy may serve as a source of infection for friendly troops and necessitate special immunizations or other precautions.

Friendly situation. The relative combat power of friendly and enemy forces and the plan of action, as well as initial and ultimate disposition of troops, determine the tactical location of supporting medical units.

Strengths to be supported. The strengths to be supported medically must be ascertained as early as possible. Normally, a table is prepared dividing the supported troop strengths into categories indicating the types and degrees of medical support each will require. These tabulated strengths are the bases against which various experience factors can be applied. Civilian and prisoner of war estimates are often included.

Physical condition of the command. A consideration of the many factors affecting the physical condition of the command will aid in determining medical measures taken prior to and during the operation, and may modify casualty estimates. Many of the factors considered require command attention, but are of interest to the surgeon as the medical advisor to the commander.

Assumptions and special factors. Action based on assumptions is normally restricted to higher levels of command, and such assumptions usually apply only to those factors beyond the control of friendly forces, such as enemy capabilities, weather, et cetera; but the medical officer must also consider the possible effects of such factors when making his estimate. Special factors are those not listed elsewhere, or items of such importance to the particular operation as to merit separate consideration.

MEDICAL ANALYSIS

Casualty estimates. The medical analysis is a logical comparison of estimated medical requirements with the medical means available for the operation. Casualty estimates, including numbers, distribution in time and space, areas of casualty density, and lines of drift or evacuation, must be calculated from the data accumulated. Experience tables, such as those contained in FM 101-10, are of value to the surgeon until such time as his own experience or the published experience of his particular theater provide sound calculations.

Medical requirements. These are calculated from available data and should be considered separately. Such items as medical supply, evacuation, hospitalization, transportation (to include additional transportation necessary for evacuation and move-

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ment of medical units and supplies), service, preventive medicine, and any others which may be indicated, should be considered.

Medical means available. The medical troops ceiling must be considered in commands the size of field army and larger. Because it takes time to secure additional medical units, their requirement and availability must be considered as early as possible. Certain limitations are placed on the use of civilian and enemy medical personnel and supplies, but they may be advantageously used in caring for their own casualties.

Medical courses of action. From a consideration of medical requirements versus means the surgeon determines his major problems, and develops general courses of action which reconcile these two elements and provide proper medical support for the operation. In comparing several medical courses of action the surgeon considers such matters as centralization versus decentralization of control, dependence upon evacuation by other military components, extent to which civilian and prisoner of war labor will be used, evacuation policies, et cetera.

MEDICAL EVALUATION

In evaluating the courses of action previously considered, the first step is a listing of the outstanding medical elements and controlling limiting features. The courses of action are compared with one another in the light of these major medical elements and the comparative advantages and disadvantages are listed.

CONCLUSIONS

In the final step of the estimate, the surgeon arrives at his conclusions, which form the basis for the development of the medical plan. Due to the surgeon's position as a special staff officer, the term "conclusions" is deemed more appropriate than the word "decision." The surgeon's conclusions provide the commander with a statement of whether or not the operation, as envisaged, can be supported medically. If not, a clear concise outline of the reasons must be included. In such rare cases, the commander will normally consider other courses of action before announcing his decision. The surgeon also includes a general statement of the course of action that best and most economically supports the commander's mission. The economic factor is introduced because any operation is but one of several to be supported in succession; therefore medical economy, while secondary to medical efficiency, is of extreme importance both to the surgeon and to his commander.

Occasionally, even when the operation can be supported, some particular medical element should be brought to the commander's attention. This is necessary to secure his personal indorsement of requests made to higher headquarters for additional medical means, or to insure that he is aware far in advance of some unavoidable medical limitation.

Lastly, the surgeon's conclusions outline the unavoidable limitations and defects which must be recognized by everyone associated with the medical service of the command. Such a listing will insure the co-ordinated effort of all concerned in reducing the effects of such limitations.

SUMMARY AND CONCLUSIONS

The medical estimate is not an isolated, separate, cumbersome administrative burden thrust upon the surgeon. It is, rather, an integral part of the process by which good medical support is evolved, and provided to the command. The procedure advocated does not require an inordinate amount of time, but operates as a timesaver for the surgeon in the field. It has been said that "It is not what the logistic planner does that takes all his time, but what he has to do over." A sound estimate of the situation will preclude "doing things over" and will eliminate costly confusion and duplication of effort.

The recommended outline for the medical estimate assists in a logical, orderly consideration of all the factors affecting the accomplishment of the medical mission of the command. It guides the novice through all the steps essential to forming a sound medical estimate, and it provides the experienced field surgeon with a valuable check list designed to conserve time and avoid costly errors of omission. The ultimate contribution of a sound medical estimate is the creating of a realistic medical plan which will combine the maximum medical service support with the utmost medical economy.

The *chronic* neurotic is one of the most time-consuming cases of all. To my mind early treatment of neurotics is medically and socially profitable, and it is well worth taking stock to see what early and adequate treatment can be given.

—R. F. TREDGOLD, M. D.
in *Lancet*, p. 411, Aug. 29, 1953

PROFESSIONAL INTEGRITY AND RESPONSIBILITY

JACK M. MESSNER, *Colonel, USAF (DC)*

THE Dental Surgeons Course which you have completed is one of the most comprehensive administrative courses that has ever been made available to a dental officer. You have received instruction in the technical know-how necessary for the administration and operation of nearly every type of dental activity. Your lectures embodied the subjects that concern all commanders and are the administrative procedures necessary for the operation of separate dental organizations.

Whether you are a dental surgeon without command responsibility or commander of a dental squadron with full command responsibility, your success is not in any way assured or guaranteed because you have successfully completed this course. The subject not included in this course, but which is most essential to your future success, is one that can't be acquired from lectures. What seems to be a lack of it may often mean only that it has not been developed or given a chance to show itself. I refer to those attributes of leadership that characterize us with dynamic or active qualities, integrity of character, and a willingness to accept responsibility.

Being dynamic means striving always to drive ahead, to break new trails, to engage in new ventures, to discover new things, to move into the unknown. It is a desire for change, an urge to stay ahead, and to do better, more ambitious things. It is a wish for growth and an abiding fear of stagnation, and it is revealed in an urge to accomplish. Unless the dental surgeon also has an urge to forge ahead and do new things, he is simply maintaining the *status quo*. In the end he will probably administer his organization right into the ground. Governments and institutions are the great gathering places for this passive administrator. His eye is on a pension, not on real progress. Closely akin to this individual is another: the man who would sacrifice the principles

From Bolling Air Force Base, Washington, D. C.

Presented at graduation exercises of Wing and Base Dental Surgeons Course, Gunter Branch, U. S. Air Force School of Aviation Medicine, Gunter Air Force Base, Ala., 5 February 1954.

and ideals of his profession for a promotion or for other personal gain. His usual passive defense is the excuse, "If you can't lick 'em, join 'em." He would have you believe "When in Rome do as the Romans do." To these persons I would reply in the words of Robert Louis Stevenson, "You cannot run away from a weakness; you must some times fight it out or perish; and if that be so, why not now, and where you stand?"

One who does not believe in the integrity of his profession will cause his community to suffer professionally, and he will never enjoy success in the eyes of his colleagues. If you are not loyal to yourself, you will never be loyal to anything. Was it not Shakespeare who said, "This above all: to thine own self be true,/and it must follow, as the night the day,/Thou canst not then be false to any man."

I wish to emphasize one point: it is you—the members of this class—who are the backbone of the dental profession in the United States Air Force. It is you who must have the courage of your convictions and a keen desire for successful achievement. A man usually prefers success in a specific field. Regardless of his specialty, the dental surgeon, to achieve success, must continuously channel his thoughts and efforts to furthering the development and progress of his profession. This endeavor has the unselfish purpose of providing better oral health for the patients for whom we are responsible.

Let me warn you here: your path will be blocked many times by those who do not understand or comprehend that what you are doing is for the benefit of others, and not solely for selfish personal gain. And may I add that often it is the person to whom we give treatment so that he can enjoy good health who offers the most resistance. At times you will be discouraged and undoubtedly you will make mistakes. You may even meet resistance by those in your own profession who have become tired and weary, and whose vision has grown dim with the passing of time. I like to recall Henry Van Dyke who said, "Courage is a virtue that the young cannot spare; to lose it is to grow old before the time: it is better to make a thousand mistakes and suffer a thousand reverses than run away from battle."

On this, your day of departure from this school, I want you to know that each of you will be expected to contribute to the building of a better dental service. This is your profession—this is your Air Force—and no one is going to do it for you. It is up to you—and you should not be satisfied with anything less than the best. Your success can only be attributed to infinite patience, hard work, and a desire for success that does not recognize defeat. To accomplish this, you must find in your own integrity of

character a highly motivated conscience. You must have unshakable self respect, resolution, and both moral and physical courage. Integrity of character is that quality which compels you to perform the more difficult task when you know it to be the right one; that quality which forces you to be selfless instead of selfish. Theodore Roosevelt once said, "Far better it is to dare mighty things, to win glorious triumphs, even though checkered by failure, than to take rank with those poor spirits who neither enjoy much nor suffer much, because they live in the gray twilight that knows neither victory nor defeat."

In addition to your integrity of character and your technical knowledge, you must have a keen sense of responsibility. I ask you not just to be satisfied to accept responsibility—go look for it—seek it out—and when you have found it, you will accept it with certain emotions that give you the courage to "stick your neck out"—to act contrary to all advice when conscience demands it—and to take full blame when all goes wrong.

I now close with the suggestion that you devote some thought to this subject. To achieve success, you must continually strengthen and reaffirm your integrity of character, your sense of responsibility, and those dynamic qualities which you do possess.

Relief from Pain

In this day when we are placing so much emphasis on silent pathology it would not seem necessary to issue an additional warning. Because of certain observed cases, I feel that this must be done. It is the warning that in relieving pain, only a symptom has been removed. The ease of elimination of this symptom does not relieve the physician of the responsibility of following through the necessary steps for adequate diagnosis of the underlying disease. It is important that this be done regardless of the wishes of the patient who frequently believes that once he feels better nothing more is necessary. Cases of bronchogenic carcinoma, tuberculosis, and other diseases of the chest have been found in patients who submitted to roentgenographic examination and work-up only on the insistence of the physician, despite their own statement that they felt perfectly well and needed no additional treatment.

—EDWIN RAYNER LEVINE, M. D.
in *Diseases of the Chest*, p. 532, Nov. 1953

OFFICER INDOCTRINATION IN PREVENTIVE MEDICINE

The Air Force Plan

NORMAN S. TALNER, *First Lieutenant, USAF (MC)*
JOHN RIZZOLO, *Lieutenant Colonel, USAF (MC)*
HUGH W. RANDEL, *Major, USAF (MC)*

IN military medicine emphasis must be placed on the prevention of disease and injury as well as on the provision of medical care for patients in hospitals. This principle is well known to all experienced military physicians and to informed line officers. Emphasizing this point, Kern [1] recently stated: "Military medicine is the application of sound medical principles to the prevention and management of injury and disease under the conditions imposed by war."

MILITARY NEED FOR PREVENTIVE MEDICINE

The preservation of fighting strength has been the major role of military medicine in the past. Notwithstanding modern advances in medical procedures and method, this fundamental objective has remained the same. Innovations, such as the antibiotics, and improved immunizations have not put an end to the need for preventive medicine in military units, but merely serve as valuable tools in accomplishing the task. Experience gained throughout the Korean conflict has re-emphasized the absolute necessity of having a medical service experienced in the prevention of noneffectiveness due to disease and injury. During the early months of the war it was observed that sanitary standards among Air Force personnel in Korea became dangerously low, and the incidence of communicable disease increased alarmingly. The following excerpt illustrates this situation:

"Beginning in July 1950, disease admission rates progressed gradually with a very definite increase noted in December. The greatest increases were in the admission of respiratory and intestinal disease groups. Overcrowded barracks, inadequate heating, poor dishwashing facilities, inexperienced personnel and other factors, combined with the inability to isolate respiratory

From Gunter Branch, U. S. Air Force School of Aviation Medicine, Gunter Air Force Base, Ala.

cases in sick bays, caused marked respiratory incidences throughout the command. Likewise, overtaxed messes, shortages in mess equipment and refrigeration, careless and hasty food preparation, and insufficient attention to routine sanitary precautions led to increased intestinal disease rates, with sporadic localized food poisoning outbreaks.

"It is an indisputable fact that Air Force personnel have not had sufficient training in living under field conditions, and in many cases personal hygiene practices were lax. Nowhere can the deficiencies or omissions apparent in Air Force control of environmental sanitation be pointed up more clearly than through the Korean experience."[2]

It should be added that many of these deficiencies occurred among newcomers to the Air Force ranks, including Medical Service personnel. Clearly there was a need for preventive medicine-minded officers in the Air Force Medical Service.

During mobilization periods the officers of the medical services of the armed services are made up largely of those from civilian practice. These physicians and dentists in civilian life are concerned solely with the diagnosis and treatment of individual patients. By training and practice they are clinicians. For this reason adaptation to military practice by the newly commissioned officer who is assigned to a hospital is relatively easy. In such an assignment he undertakes the care and treatment of military patients in much the same way as he did in civilian life. The amount of indoctrination required to fit such officers for their immediate assignments is minimal.

For those officers assigned to field units or as staff surgeons, however, there is greater need for military indoctrination. A basic requirement of this indoctrination is that officers acquire a full appreciation of the concept of military preventive medicine. They must think in terms of the physical fitness and military effectiveness of large groups rather than of individual patients in the hospital. Such reorientation of physicians is not always easy. They tend to focus their attention on the most interesting medical patients in the hospital who are often relatively unimportant from a military standpoint—for example, a difficult endocrine diagnostic problem. On the other hand, common and professionally less interesting conditions such as athletes foot or scabies are of utmost military importance when they occur in large numbers of troops. Military physicians must recognize that it is the collective effect of a disease that determines its military significance. In evaluating this military significance one must consider not only the hospital admissions and deaths, but also man-

days lost, disability separations, effect on morale, and the general lowering of unit effectiveness.

INDOCTRINATION OF OFFICERS

In a recent article Strickland and Nuernberger[3] outlined the curriculum of the officers indoctrination course for all newly commissioned officers of the Medical Service given at this school. They pointed out that of the total instructional hours, 31 hours are devoted to preventive medicine. The composition of these preventive medicine hours, together with the educational methods used to obtain maximum student comprehension, are described in this article. This large proportion of preventive medicine is considered essential in such an indoctrination course for the following reasons:

1. As has been indicated, the principal basic difference between civilian medical practice and military medicine is the important concept of prevention.

2. In the prevention of disease and injury all officers are involved. Preventive medicine officers are not enough. An effective preventive medicine program requires the enlightened and active participation of all personnel of a command.

3. The goal of instruction is not only to prepare officers for their next duty assignment but to raise the general level of their military effectiveness for any future assignments.

PLAN OF THE COURSE

In the officers indoctrination course, an attempt is made to give newly commissioned officers of the Medical Service an overall picture of the preventive medicine program, emphasizing current problems in terms of military noneffectiveness, and those measures currently in use for the control of these problems.

Each hour is planned to use, as much as possible, pertinent audio-visual aids, and to foster active student participation. Four general areas of instruction in the course will be briefly summarized: (1) military epidemiology; (2) environmental sanitation; (3) the preventive medicine staff problem; and (4) preventive medicine records.

MILITARY EPIDEMIOLOGY

Seventeen hours on this subject are devoted entirely to medical considerations and are presented by Medical Corps officers. Students are first oriented in the principles of epidemiology and epidemiological investigation, and then various communicable diseases, including malaria, infectious hepatitis, respiratory

diseases, and the intestinal diseases, are discussed from the epidemiological viewpoint. Emphasis is placed on the sources, spread, and control of communicable disease, particularly those now confronting the Air Force. Policies on immunization and international quarantine are considered, as both are highly pertinent subjects in a globally deployed force. In addition, preventive medicine problems under varying environmental conditions are stressed, including salt and water requirements in tropic areas and the adverse effects of cold in arctic regions. In regard to the servicing, maintenance, and modification of aircraft and related equipment, Air Force operations of necessity include a large amount of industrial activity with attendant industrial medical problems. Many of these problems are common to all industries. A few, however, such as the toxic effects of aircraft fuels and solvents and the noise problem produced by jet engines, are peculiar to this service. These problems and the possible means for their solution are reviewed. The medical aspects of defense against biologic warfare with its various ramifications are covered, together with a discussion of the history, possible biologic warfare agents, mode of dissemination, detection devices, and current defense measures. This is part of the Air Force's aim to give basic information on the medical aspects of defense against unconventional methods of warfare—atomic, chemical, and biologic.

ENVIRONMENTAL SANITATION

These hours of instruction are presented by sanitary engineers and an entomologist. Water purification, waste disposal, food service sanitation, and arthropod- and rodent-control measures are emphasized. Of particular value in this section are three demonstrations: the sanitation-demonstration area, the preventive medicine laboratory, and a housing inspection. At the sanitation-demonstration area the student sees improvised sanitary devices in operation under simulated field conditions (fig. 1). On the tour through the preventive medicine laboratory, specimens of vectors and reservoirs of disease are exhibited, various personal protective devices are shown, and implements for control are demonstrated (fig. 2). This serves to integrate much of the material presented earlier in the epidemiology lectures, because the student, having first been told of a particular disease problem, sees at firsthand the vectors and reservoirs of the disease and the equipment used for its control. In participating in the housing inspection, the student officers are performing a function which they may be called on to do at their assigned bases. Principles of a proper housing inspection, to discover and correct deficiencies, are brought out.

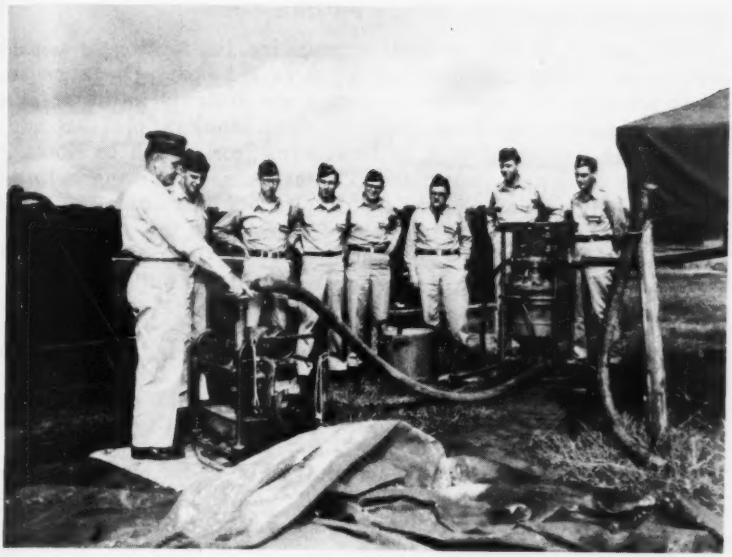

Figure 1. Demonstration of field water purification equipment.

Figure 2. Demonstration of disease vectors and reservoirs, personal protective measures, and field insect- and rodent-control devices.

STAFF PROBLEM

This portion of the preventive medicine instruction is considered to be one of the most important in the course because students are afforded a chance to participate actively in the solution of a preventive medicine field problem. Such a problem might involve the movement of a tactical wing from Japan to Korea in which the student prepares the preventive medicine annex to the over-all medical plan and the sanitary order. Practical application is made of the material presented throughout the course. The format of the problem is presented early in the course, and the students are divided into groups to work out the solution. Toward the end of the course a seminar is held at which officers of the various corps present their solutions. A physician, sanitary engineer, and entomologist from the preventive medicine staff moderate.

RECORDS AND REPORTS

This portion of instruction is sectionalized for Medical Corps and Medical Service Corps officers who may be called on to complete these records and file the necessary reports. Familiarizing the students with the necessary procedures involved in filling out the forms facilitates their future job assignments. Comprehensive coverage is given to the various preventive medicine reports, immunization records, and epidemiological investigation of venereal disease contacts.

SUMMARY

For service indoctrination in the principles of preventive medicine and sanitation, newly commissioned officers of the Medical Service are given a comprehensive course in preventive medicine which includes epidemiology, environmental sanitation, preventive medicine staff problem, and preventive medicine reports and records.

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THE AIR FORCE RESERVE MEDICAL TRAINING PROGRAM

ARTHUR L. STREETER, *Colonel, USAF (MC)*

THE Air Force reserve training program, administered by the Continental Air Command located at Mitchel Air Force Base on Long Island, New York, carries out its reserve training functions through four numbered air forces, each covering about one quarter of the population of the United States. In some areas these air forces are subdivided into districts, a procedure which encourages a closer relationship between the individual reservist and the Air Force.

The purpose of this reserve program is to provide trained personnel ready and willing to defend their country on short notice whenever an enemy threatens its safety. To meet this requirement it is necessary to build a varied program which can adapt to the needs of the reservist who can spare only a limited time from his civilian pursuits, yet fulfill the purpose for which it was created. To this end considerable thought and effort have been expended in establishing and implementing the reserve training program. It must be borne in mind that the program is designed primarily for the protection of our country, not for the welfare of the individual reservist. It is obvious, however, that the reservist must believe that the program is worthy of his time and effort or it will collapse from its own weight. Constructive criticisms are welcome at all times.

ORGANIZATIONAL TRAINING

The Air Force reserve training program offers many different types of training for the reservist, but I plan to discuss only that part of the program that applies to the officers of the Medical Service.

The most highly organized units are the medical groups of the organized reserve wings, 25 of which are located throughout the country and near the larger centers of population. These medical groups consist of from 14 to 38 officers and from 71 to 110 air-

From Headquarters, Continental Air Command, Mitchel Air Force Base, N. Y.

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men, depending on the type of wing and the size of the hospital each group is required to operate. Participation in six of these units is limited to ready reservists, and the remainder may be manned either by ready or by standby personnel. All must agree to serve within 90 days after call to active duty in a national emergency, and must serve 15 days' active duty each year.

The second unit, the volunteer air reserve training unit, has been our main standby for several years, and at present there are 97 groups and 430 squadrons. Most of the Medical Service reservists in this type of unit are serving as individuals, along with other Air Force reservists, and are therefore receiving only nonmedical training; however, a few medical squadrons and flights are organized. Training consists of film showings, guest speakers, and programs put on by members of the unit. It is mainly self-taught. Members do not receive any pay for this training, but are given point credits toward promotion and retirement.

The third unit is the newest, as well as the one which I believe most nearly fits the needs of most reservists for training in the Medical Service. This is the specialist training center, which is organized into a squadron of 100 officers and a squadron of 200 airmen. Each squadron is provided with adequate instructors and training aids, and is designed to teach a single career field, but may be broken into flights of 25 officers or 50 airmen, each with its own career field. In the case of highly specialized career fields, such as medicine, only five officers are required to organize a flight at any center. At present there are 20 of these specialist training centers operating, with a total of 50 planned for the current fiscal year. The organizational concept is very flexible and adapts itself to meet the needs of nearly any locality. Plans are being studied which would authorize detached flights of specialists at different locations so that more reservists can take part. The staff of my office has prepared a medical course plan for a two-year course and a text for the first year's training for each of the officer and airman squadrons. The subjects covered vary from refresher training in recent advances in administration to atomic warfare. Other subjects include training in altitude physiology, air evacuation, arctic, tropical, and desert survival, and military medicine and surgery, thereby briefly covering the field of aviation medicine. Members may receive pay when specifically authorized and when they meet requirements, and all receive point credits for promotion and retirement. Members of the volunteer air reserve training units may also be attached to this type of unit for training.

INDIVIDUAL TRAINING

There are individual training opportunities for Air Force reservists who are not assigned to a reserve training unit. At the head of the list comes the mobilization assignment, which assigns the reservist to the specific position he is expected to occupy in the event of general mobilization. He is usually assigned to an administrative position which requires familiarization with current operating procedures. Several of these assignments are to the Office of the Surgeon General, others are to hospitals in various capacities. These reservists receive pay as well as promotion and retirement credits, but must serve 15 days' active duty each year.

Closely associated with the above unit is the mobilization designation. This is similar to the mobilization assignment except that those participating do not draw pay, need not serve 15 days' active duty, and are not as vulnerable for recall to active military service.

The largest group of Air Force reservists belongs to the nonaffiliated reserve section. This is an unorganized group who are eligible for point credits for promotion and retirement; however, many of them do not qualify. Each reservist must now earn at least 15 point credits a year to remain in the reserve, in any active capacity, in addition to the 15 points awarded for being a reservist. Training in this group consists mostly of extension courses and occasional attendance at a short-term service school, an annual meeting of a national medical society, or a medico-military symposium such as the one presently being sponsored by the Navy.

The unfortunate reservist who fails to meet the criteria for minimum participation by failing to earn 15 point credits a year is placed in the ineligible reserve section. There he remains until reinstated, retired at his request, or dropped from the reserve list.

A subject of related interest worth mentioning here is Continental Air Command's new *Medical Training Bulletin*. The first issue will soon be delivered to inactive reservists of the Air Force Medical Service. This bulletin, a combination of the former *Medical Information Bulletin* for reservists and the Continental Air Command numbered medical bulletins for active-duty personnel, will be published at least quarterly. Its purpose is to inform the reservist of developments and events in the active service, and it includes a current bibliography, primarily for the use of instructors in reserve medical training. Distribution will follow the pattern set by the former publication.

We must work together to improve the lot of the reservist; however, we must remember that the importance of any reserve program is predicated on our country's need for the services it provides, not on the needs of the individual. Fortunately, however, the more thoroughly a reservist prepares himself to contribute to his country's defense, the greater are the benefits which he will derive as an individual.

Medical Management of Alcoholism

Alcoholism is a medical problem with somatic and psychologic aspects, both of which may be modified by modern treatment. There is no longer any reason for the hopeless attitude that formerly surrounded this affliction.

The acute alcoholic state is a crisis in the course of chronic alcoholism. The most destructive acts and consequences of the alcoholic's course usually occur in this phase. The acute alcoholic state presents physiologic and psychologic problems peculiar to it. The long-range treatment must include medical and psychologic approaches. Recently developed medical therapies have greatly increased the physician's success in the management of alcoholism. Of these, disulfiram (antabuse) seems to be the most important development in the long-range medical treatment of alcoholism. With the revision of dosage schedules, the number of disabling side-effects has been markedly reduced, and experience has shown that many previous contraindications no longer seem valid. The antihistamines appear to be a specific antidote for alcohol-disulfiram reaction, and severe, potentially dangerous reactions can now be controlled to a great degree.

Medical therapies can be successful only when administered by a physician who has a sympathetic understanding of the alcoholic in the broadest sense and who is willing to exercise great patience and tolerance in his approach to the alcoholic patient. By the same token, the psychotherapy of alcoholism can be carried out by a sympathetic physician; in many cases, psychiatric referral is not necessary. Community resources can play an important part in the patient's rehabilitation and should not be overlooked.

—DANIEL J. FELDMAN, M. D., and
HOWARD D. ZUCKER, M. D.
in *Journal of the American Medical Association*, p. 901, Nov. 7, 1953

AN INEXPENSIVE DRYER FOR DENTAL X-RAY FILMS

CARLOS F. SCHUESSLER, *Colonel, USAF (DC)*

IN TROPICAL or humid climates where the time required to dry dental x-ray films is often excessive, dental officers must read wet films, which at best is an unsatisfactory method. Bite wing roentgenograms, a valuable adjunct to an examination and the charting of dental defects on Air Force Form 309, require several hours, if not overnight, to dry in many humid areas. This makes it necessary for the examining dentist to wait until the next day to complete his examination.

Because of this time lag an inexpensive dryer for dental x-ray films was devised at this hospital and housed in an existing cabinet (fig. 1). A plywood frame was made to fit snugly into the cabinet. In the top portion of this frame small aluminum tubes were inserted on which x-ray film holders were hung. The lower end of the holders were inserted into small slots in the top wooden shelf to keep them from fluttering when the blower is in operation.

A household type aluminum cookie pan was placed on the second wooden shelf to catch excess water dripping from film holders. In each end of the two wooden shelves a large rectangular opening allowed the blower to circulate the air past the heating elements and through the wet x-ray films.

The heating elements used were two standard heating coils connected in series and controlled by a thermostat of the type generally used on the oven of a household electric stove. A toggle switch, a female wall plug such as is used in most electrical systems of our modern homes, and a small inexpensive electric fan made up the rest of the equipment necessary to assemble this dryer.

The assembly of the heating unit is quite simple. An aluminum plate approximately one sixteenth of an inch thick, and of sufficient area to accommodate the heating element sockets, switch, female wall socket, and thermostat control knob, is drilled for mounting the above-described equipment. The equipment is

From U. S. Air Force Hospital, Ramey Air Force Base, Puerto Rico.

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mounted on aluminum plate and wire as shown in figure 2. After wiring is completed the assembly is mounted on the box shown in the lower left-hand corner of figure 1, and the bulb end of the thermostat is placed above the heating elements. The fan plug

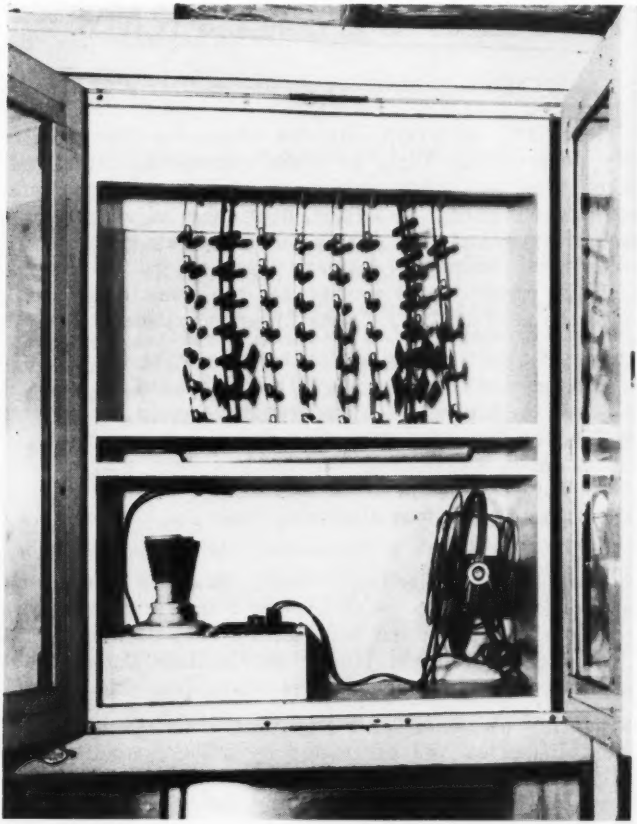

Figure 1.

is connected to the female wall receptacle, a thermometer is hung from the aluminum tube in the film compartment, the switch is turned on, and the thermostat is adjusted for proper temperature. The blower must always be in operation while the heating elements are turned on, but if only air circulation is desired, the heating elements can be removed.

I have found that the normal opening and closing of the cabinet to insert or remove films is sufficient to circulate and change

the air when it becomes saturated with moisture. Danger of a fire caused by the dryer is very slight because the thermostat prevents the heating elements from overheating. Because they are connected in series only half their normal heat is produced. The possibility of a short circuit in one of the electrical connections is no greater than with any other electrical appliance.

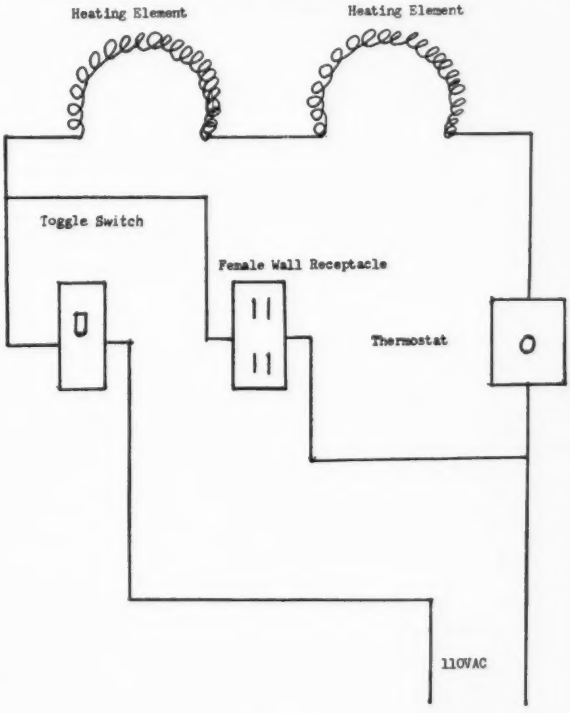

Figure 2.

The cabinet shown in the illustration is 30 inches in height, 25 inches in width and 11½ inches in depth; however, any cabinet with measurements approximating these would be adequate. If no cabinet is available, a back panel and door may be placed on the unit which could then be mounted on the wall of the x-ray developing room.

This apparatus will dry 120 dental films completely in less than 10 minutes.

MODIFIED STRETCHER FOR PATIENTS WITH INJURIES OF THE CERVICAL SPINE

H. TODD STRADFORD, *Commander, MC, USN*

UNDER ideal conditions, the transportation of a patient with injuries of the cervical spine is difficult and hazardous. In the field, movement of such a military patient is a much greater problem. By devising a traction apparatus from easily accessible materials for the ordinary field stretcher, this problem was simplified so that such patients could be evacuated by helicopter.

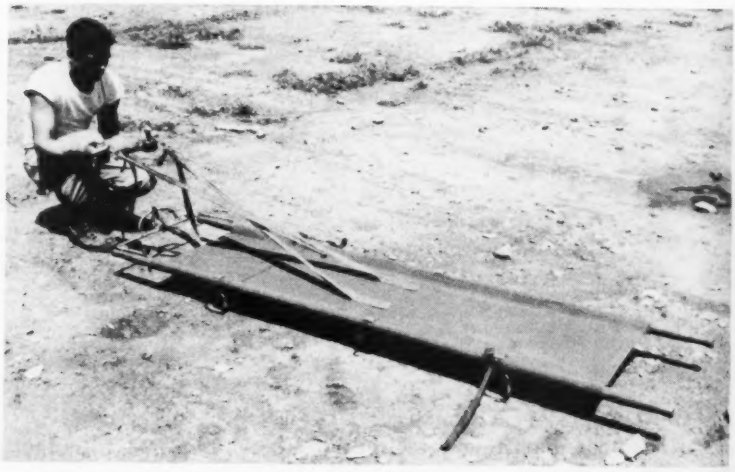

Figure 1.

It was found that the field stretcher could be modified to serve this purpose. Two aviation harness belts were sewed to the stretcher as shown in figure 1. The harness is carried across the patient's shoulders and snapped over a hook on each side of

From Headquarters, 1st Medical Battalion, 1st Marine Division (Reinf). Comdr. Stradford is now assigned to Headquarters, 3d Marine Division, Fleet Marine Force, c/o Fleet Post Office, San Francisco, Calif.

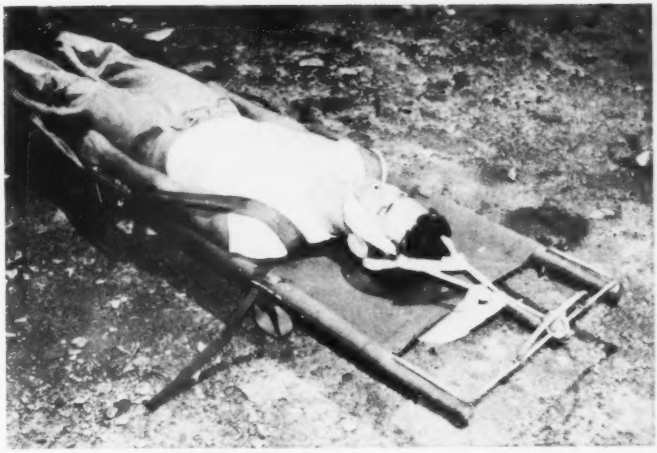

Figure 2.

the stretcher frame. The adjustable slide of the harness is then snugged up. The long straps permit adjustment to fit either a tall or a short person, and crossing them behind the patient

Figure 3.

stabilizes the straps over the shoulders yet causes no pressure on the spine or chest. Figure 2 shows an improvised head harness with rubber tubing traction. The removable bar and pulley frame is versatile and can be stabilized by hanging weights, elastic, or Spanish windlass traction; the latter is demonstrated in figure 3. The bar was constructed from parts of a Thomas splint and a pulley, and was anchored by inserting it through two drill holes at a point in the stretcher frame where both metal and wood are traversed. A band of adhesive tape wrapped over the bar prevents any possible mishaps in handling. Figure 4 shows the strap hooks; the headpiece is detached.

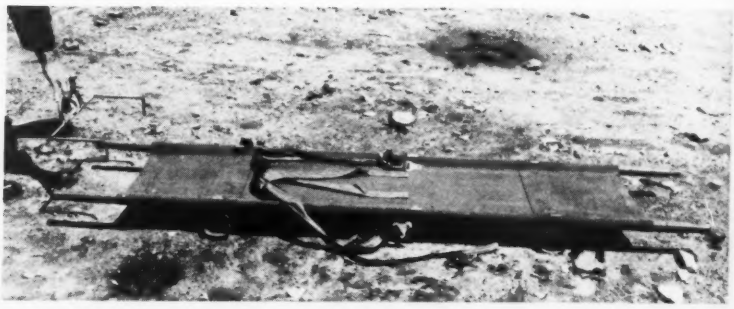

Figure 4.

This modification of the stretcher adds very little weight and does not alter its over-all size. It is easily carried and fits in the conventional means of transport, including all types of helicopters.

Alteration of this stretcher in this manner does not prevent its use for evacuation of other types of casualties. It should also be found useful by civilian disaster units.

Financial Support for Atherosclerosis

Proceeding along the lines indicated by the cholesterol concept of atherosclerosis, both experimental and clinical research on atherosclerosis can be expected to report continued significant progress in the years immediately ahead provided adequate financial support for such studies are forthcoming. Undoubtedly further advances will eventually bring fruitful therapeutic and prophylactic means applicable to man.

—LOUIS N. KATZ, M. D.
in *Heart Bulletin*, p. 77, July-Aug. 1953

OFFICIAL DECORATIONS

SILVER STAR

Morton I. Silver, *Lt. (jg) (DC) USNR*

LEGION OF MERIT

Gennaro Basilicato, *Comdr. (MC) USN*
Ruby G. Bradley, *Lt. Col.*, NC, USA
Pearson W. Brown, *Col., DC, USA*
Francis L. Carroll, *Lt. Col., MC, USA*
William M. Fowler, *Capt. (DC) USN*
Eugene R. Hering, *Capt. (MC) USN**
James R. Karr, *Col., MC, USA*
Frederick B. Lukins, *Comdr. (DC) USN*
Ocie B. Morrison, *Rear Adm. (MC) USN*
Dean Schamber, *Col., MC, USA*
Max H. Watkins, *Col., USAF (MSC)*

BRONZE STAR MEDAL

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Alexander Blum, *Lt. (jg) (MC) USNR*
Shelby W. Brown, Jr., *First Lt., MSC, USA*
Arthur J. Carbonell, *Lt. Col., MC, USA*
Peter T. Cassalia, *Lt. (jg) (DC) USN*
Salter J. Cochran, *First Lt., MC, USA*
Aurven C. DeBerry, *Capt., DC, USA*
David A. Dobson, Jr., *First Lt., MSC, USA*
Francis J. Fearon, *First Lt., MSC, USA*
Francis L. Flatt, *Lt. Col., DC, USA*
Lyle G. Fritze, *2d Lt., MSC, USA*
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James W. Gilchrist, *Lt. (MC) USN*
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Ingomar A. Hoberg, *Lt. Col., MSC, USA*
Robert W. Jamieson, *First Lt., MC, USA*
Clarence R. Jones, Jr., *First Lt., MSC, USA*
Oliver R. Kendrick, *Lt. Col., MC, USA*
Robert L. King, Jr., *Lt. (MC) USN*
Edward C. Knoblock, *Maj., MSC, USA*
Richard A. Lavin, *Lt. (MC) USN*
Tobert D. Leonard, *2d Lt., MSC, USA*
Erwin S. Lighterman, *First Lt., DC, USA*
John T. Lord, *Lt. (MC) USNR*
Daniel E. Mahaffey, *Lt. (jg) (MC) USNR*
Vincent J. Marecki, *Lt. (jg) (MC) USNR*
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Norman C. Moore, *First Lt., MSC, USA*
William L. Mueleman, *Capt., MC, USA*
Howard E. Nepp, *First Lt., MC, USA*
Frank E. Osmer, *Capt., MSC, USA*
Ralph C. Parker, *Comdr. (MC) USN*
James J. Pattee, *Capt., MC, USA*
Burton E. Phillips, *Capt., MC, USA*
Irving Puziss, *First Lt., MSC, USA*
Austin Redmon, *Capt., MSC, USA*
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Charles Shore, *First Lt., MC, USA*
James H. Snyder, *Lt. (DC) USN*
Walter P. Stenborg, *Lt. (MC) USNR*
Harold Sussman, *First Lt., MC, USA*
Charles S. Turner, Jr., *Lt. (jg) (MC) USNR*
George B. Voigt, *First Lt., MC, USA*

*First Oak Leaf Cluster.

In this department each month the names of officers of the medical services who have been awarded decorations by the United States Army, Navy, or Air Force since the beginning of the Korean campaign are published following receipt of this information from official sources—*Editor.*

BRONZE STAR MEDAL——Continued

Deno J. Wedes, *Capt., MC, USA*
Paul J. Wentworth, *Capt., MSC, USA*
Lawrence A. Whoolery, *Lt. Comdr. (MC) USN*
Collins Wight, *Lt. Col., MSC, USA*
George R. Wilbourn, *First Lt., MSC, USA*
Theodore H. Wilson, *Lt. (jg) (MC) USN*
Stanley I. Wolf, *Lt. (jg) (MC) USNR*

COMMENDATION RIBBON

Wilson D. Alford, *First Lt., MSC, USA*
Arthur M. Anderson, *Lt. (jg) (MC) USNR*
John M. Apple, *First Lt., MC, USA*
Annette Baer, *Lt. (NC) USN*
Jack C. Berger, *Lt. (MC) USN*
Leonard B. Berman, *Lt. (jg) (MC) USN*
William E. Bowlus, *First Lt., MSC, USA*
Charles H. Bramlitt, *Col., USAF (MC)*
Render L. Braswell, *Col., USAF (MC)*
Dale E. Brown, *Capt., MSC, USA*
Thomas K. Burnap, *Lt. (jg) (MC) USNR*
William E. Cape, *First Lt., MC, USA*
Charles B. Chambers, *Lt. (jg) (MC) USNR*
Frank F. Daughters, *Capt., MC, USA*
Carl W. DeOnier, *Lt. Comdr. (MC) USN*
Ivan C. Dimmick, Jr., *Lt. Col., MC, USA*
Samuel Doughty, *Lt. (MC) USNR*
Howard B. Dressel, *WOHC, USN*
John T. Egan, Jr., *Lt. (MC) USN*
James G. Espey, Jr., *Lt. Col., USAF (MC)*
Frank A. Folk, *Lt. (jg) (MC) USNR*
Orville M. Graves, *Lt. (MC) USN*
Harry W. Gray, *Lt. (jg) (MC) USNR*
Alvin H. Hein, *Capt., MSC, USA*
Reginald S. Henry, *Lt. (jg) (MC) USNR*
Irwin Heyman, *Capt., DC, USA*
Edward P. Irons, *Comdr. (MC) USN*
Ruel C. Irwin, *Maj., MSC, USA*
Harvey S. Johnson, *Comdr. (DC) USN*
Howard A. Johnson, Jr., *First Lt., MSC, USA*
Clarence Kaplan, *Capt., MSC, USA*
Tomlin P. Kendrick, *First Lt., MSC, USA*
Gordon Kennedy, Jr., *First Lt., MSC, USA*
Francis W. Kubbs, *Capt., MC, USA*
Stephen V. Landreth, *Lt. (MC) USN*
Norman Levin, *First Lt., MC, USA*
Robert O. Lipe, *Lt. (MC) USNR*
Graham Margot, *First Lt. MSC, USA*
Samuel C. Maxeiner, *Lt. (MC) USNR*
John H. McLaughlin, *Lt. (jg) (MC) USNR*
Donald A. McLean, *Lt. (MC) USNR*
John P. Mitrega, *Capt., MSC, USA*
James G. Moore, *Col., USAF (MC)*
Donald C. Overy, *Lt. (jg) (MC) USNR*
Arthur E. Pauley, *CWOHC, USN*
Murray Pescow, *First Lt., MSC, USA*
James L. Price, *Capt., DC, USA*
William F. Prior, Jr., *Lt. (jg) (MC) USNR*
Charles P. Richardson, *Lt. (jg) (MC) USN*
Raymond N. Ritter, *Capt., MSC, USA*
Mark L. Shannon, *CWOHC, USN*
Maurice E. Simpson, *Comdr. (DC) USN*
Jack E. Staples, *First Lt., MSC, USA*
Arthur L. Streeter, *Col., USAF (MC)*
William R. Thomas, *Lt. (jg) (MC) USN*
Richard H. Tullis, *Lt. (MC) USN*
John W. Vester, *First Lt., MC, USA*
Bernice R. Walters, *Lt. Comdr. (MC) USNR*
Corliss M. Welch, *Lt. (MC) USNR*
Lee H. Willer, *Lt. (jg) (MC) USNR*
John E. Williams, *Lt. (jg) (MC) USNR*
Lewis D. Williams, *Comdr. (MC) USNR*
Charles B. Willingham, *WOHC, USN*
Harry T. Winkler, *Capt., MSC, USA*
Henry M. Woolf, *Maj., MC, USA*
William H. Yeager, Jr., *Capt., MC, USA*

Adequate Breast Biopsy

Earlier diagnosis of the breast cancer demands prompt biopsy of any localized area that varies from the surrounding tissue. "Watchful waiting" is a dangerous policy that may deprive the patient of treatment during the period of curability. Adequate biopsy consists of the removal of sufficient breast tissue to reveal the presence of any obvious or occult cancer by immediate thorough pathologic examination.

—THOMAS A. SHALLOW, M. D., et al.
in *A. M. A. Archives of Surgery*, pp. 535-536, Oct. 1953

Program of A. M. A. Military Medicine Section, 23-25 June

Timely professional subjects of equal interest to both civilian and service physicians have been included in the program of the Section on Military Medicine to be presented during the annual meeting of the American Medical Association in San Francisco 21-25 June 1954 under the chairmanship of Major General Harry G. Armstrong, Surgeon General, U. S. Air Force.

The section will meet on the mornings of 23, 24, and 25 June, according to Colonel Charles L. Leedham, MC, USA, Secretary of the Section, who also announced that the final morning would be devoted to a joint session with the Sections on General Practice and Anesthesia on the subject of pain.

Following is a complete program of the presentations to be made before the section:

Wednesday, 23 June

Military Medicine Today—Maj. Gen. Harry G. Armstrong, USAF (MC), The Surgeon General, U. S. Air Force.

The Initial Care of the Severely Wounded—Maj. Curtis P. Artz, MC, USA, Brooke Army Medical Center, Fort Sam Houston, Tex.

Arterial Grafts in Military Surgery—Capt. Robert B. Brown (MC) USN, U. S. Naval Hospital, Bethesda, Md.

The Tissue Bank in Military Medicine—Capt. Edwin Coyl (MC) USN, U. S. Naval Medical School, Bethesda, Md.

Chorioretinal Burns Produced by Atomic Flash—Col. Victor A. Byrnes, USAF (MC), Headquarters, U. S. Air Forces in Europe, Wiesbaden, Germany.

The MEND (Medical Education for National Defense) Program—Dr. Stanley Olson, Dean, Baylor University, College of Medicine, Houston, Tex.

Current Problems in Military Medicine—Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical).

Thursday, 24 June

Rapid Test for Determining Antibiotic Treatment—Lt. Col. Vincent M. Downey, USAF (MC); Capt. William E. Dye, USAF (MSC); Capt. Roland B. Mitchell, USAF (MSC), U. S. Air Force School of Aviation Medicine, Randolph Air Force Base, Tex.; and 1st Lt. David F. Hersey, USAF (MSC), Lackland Air Force Base, Tex.

Thursday, 24 June—Continued

The Intermediate Coronary Syndrome in Military Personnel—Capt. Ashton Graybiel (MC) USN, U. S. Naval School of Aviation Medicine, Pensacola, Fla.

The Value of Exercise Tolerance Tests in Predicting Cardiac Pathology (A 10-year follow-up study of 1000 military personnel)—Col. Thomas W. Mattingly, MC, USA, Walter Reed Army Hospital, Washington, D. C.; and Dr. George P. Robb, New York, N. Y.

Human Tolerance in Relation to Destructive Force—Brig Gen. Otis O. Benson, Jr., USAF (MC), Office of The Surgeon General, Dept. of the Air Force, Washington, D. C.

Medical Experiences in Communist POW Camps in North Korea—Capt. Clarence L. Anderson, MC, USA; Capt. Sidney Esensten, MC, USA, Letterman Army Hospital, San Francisco, Calif.; Capt. Alexander M. Boysen, MC, USA; Capt. Gene M. Lam, MC, USA, Brooke Army Hospital, Fort Sam Houston, Tex.; and Capt. William R. Shadish, MC, USA, Walter Reed Army Hospital, Washington, D. C.

Military Medicine, Civilian Medicine and the American Medical Association—Dr. Louis H. Bauer, Past President, American Medical Association; Secretary-General, World Medical Association, New York, N. Y.

Friday, 25 June

Joint Meeting with the General Practice Section and the Anesthesia Section—Subject: *Pain.*

Cancer Chemotherapy

The whole concept of specific cancer chemotherapy depends upon the existence of specific anabolic patterns for nucleic acid by particular cell types, including the neoplastic. There is good evidence that these exist for normal cells, although they will unquestionably turn out to be much more complicated, and presumably much more varied and specific than present methods permit us to define. Different, and so useful, specificities will undoubtedly be found to exist for different types of neoplasms. This has also been advanced as an argument by those who oppose work in cancer chemotherapy. The most pessimistic pronouncement on this point is one recently made that 1,000 different agents will be needed for 1,000 different kinds of cancer. This is unlikely, since perhaps the majority of the cancer deaths are due to disease of a few general types. Data already existing on human therapy indicate that the responses by minor variants within these types tend to be similar, even though not identical.

—C. P. RHOADS
in *Science*,
p. 79, Jan. 15, 1954

REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Radiology

Activated in 1934, the American Board of Radiology on 30 June 1953 had certified 4,341 physicians in the various branches of this specialty of whom 73 were regular officers of the U. S. Army, Navy, and Air Force. According the respective surgeons general, these specialists are:

Samuel H. Alexander, *Col., USA*
Harold I. Amory, *Col., USA*
Ernest C. Aulls, *Capt., USN*
Robert J. Ayella, *Capt., USA*

Leonard H. Barber, *Comdr., USN*
William E. Barry, *Lt. Col., USA*
John C. Bates, *Maj., USA*
Albert J. Bauer, *Lt. Col., USA*
Charles F. Behrens, *Rear Adm., USN*
Carr E. Bentel, *Capt., USN*
Harry L. Berman, *Col., USA*
George C. Bess, *Lt. Col., USAF*
Grover C. Bolin, Jr., *Capt., USA*
James G. Bulgrin, *Capt., USN*
Clement D. Burroughs, *Comdr., USN*

Richard Y. Card, *Capt., USAF*
Phillips L. Claud, *Comdr., USN*
William S. Cole, *Comdr., USN*
James P. Cooney, *Brig. Gen., USA*
Carroll S. Crawford, *Maj., USA*

Giffin C. Daughtridge, *Capt., USN*
Edward M. DeYoung, *Col., USA*
Robert C. Douthat, *Capt., USN*
Dell F. Dullum, *Col., USA*

Lyle H. Edelblute, *Lt. Col., USA*
Richard W. Eells, *Capt., USAF*

John S. Featherston, *Lt., USN*

Charles Gartenlaub, *Capt., USN*
Leon D. Graybill, *Capt., USA*

Alexander O. Haff, *Col., USA*
Norris M. Hardisty, *Capt., USN*
Russell C. Harrison, *Capt., USA*
John L. Hatch, *Capt., USN*
John H. Heald, *Lt., USN*
Romeyn J. Healy, Jr., *Col., USA*

John A. Isherwood, *Col., USA*

Reginald C. Jackson, *Capt., USA*
Bruno O. Junnila, *Comdr., USN*

James M. Keegan, *Maj., USAF*
Douglas S. Kellogg, *Col., USA*
Cecil H. Kimball, *Capt., USA*
John M. Kohl, *Maj., USAF*

Leslie W. Langs, *Comdr., USN*
Joseph H. Lawson, *Lt., USN*
Frank Y. Leaver, *Col., USA*
Elmer A. Lodmell, *Col., USA*
George F. Lull, Jr., *Lt. Col., USA*

Archibald G. M. Martin, *Maj., USAF*
Malcolm W. Mason, *Comdr., USN*
Robert V. McAllister, *Maj., USA*
T. Donald McCarthy, *Col., USA*
Kenneth L. McEwen, *Maj., USA*

Hyman R. Osheroff, *Col., USA*

Paul A. Paden, *Col., USA*
Ralph S. Penner, *Maj., USA*
Charles B. Perkins, *Col., USAF*
William E. Pinner, *Capt., USN*

Allan B. Ramsay, *Col., USA*
Wendell W. Robley, *Lt. Comdr., USN*

Charles E. Spellman, *Col., USA*
Albert H. Staderman, *Capt., USN*
Robert J. Steinborg, *Capt., USA*
Donald W. S. Stiff, *Maj., USA*

This is the seventh of a series. The names of officers certified by the American Board of Urology will be published in the May issue.

RADIOLOGY—Continued

Donald R. Taylor, *Maj., USA*

Robert J. Vaughn, *Capt., USN*
Harold A. Vinson, *Lt. Col., USA*

Roger K. Wallace, *Lt., USN*
Paul O. Wells, *Col., USA*

Sylvester F. Williams, *Comdr., USN*
James G. Wood, Jr., *Maj., USA*
John P. Wood, *Capt., USN*
William A. Wulfman, *Comdr., USN*

Peter Zanca, *Col., USA*

DEATHS

FOY, Eugene Thomas, Captain (MC) USN, Headquarters, Fleet Marine Force, Pacific Fleet; graduated from Temple University School of Medicine in 1928; served on active duty from March 1942 to October 1946; recalled to active duty June 1948; died 26 February 1954, age 52, of acute myocardial infarction, at the Tripler Army Hospital, Honolulu, T. H.

MARTIN, Robert Glasgow, Lieutenant (DC) USN, Fleet Aircraft Service Squadron, Coco Solo, C. Z.; graduated from Michigan University College of Dentistry in 1946; ordered to active duty July 1946; died 13 February 1954, age 31, of anterior acute bulbar poliomyelitis, at U. S. Naval Hospital, Coco Solo, C. Z.

WITHERS, Samuel Meacham, Jr., Major, MC, USAR, graduated from University of Georgia School of Medicine in 1935; served during World War II; honorably relieved from active duty on 22 November 1945; recalled to active duty in October 1950; commanding officer of the 548th General Dispensary in Korea when he died 19 June 1953, age 48, of myocardial infarction.

A MESSAGE FROM THE A. M. A.

During the past several weeks the Council on National Emergency Medical Service has received several letters from physicians in military service suggesting that their current tour of active duty be cut short because of the fact that they were in service during World War II. Those who have submitted these suggestions were, for the most part, classified in priority II under the "doctor draft law" prior to their entrance on active duty. They believe that an inequitable situation has been created by the requirement that they serve an additional 24 months, whereas a man with little or no service from priority I or III is also required to serve only 24 months. In view of the continuing interest in this provision of the law it is thought that a review of the history of the actions of the Association with respect to priority II registrants is in order.

In the summer of 1950 hearings were held by the Armed Services Committees of the House of Representatives and the Senate on the bills which became Public Law 779, 81st Congress. In presenting its testimony, the American Medical Association approved several amendments to the bill, one of which recommended that the present priorities II and III be reversed. Our recommendation in this regard was not accepted and substantially the present priority system was established.

Between the time of the passage of the original Act on 9 September 1950 and its expiration date of 1 July 1953 most of the men in priorities I and II were called into service. It was believed, therefore, at the time of the hearings last spring on the proposed extension of the law to 1 July 1955 that a new formula must be devised to provide the greatest equity to those men who had a substantial amount of service during World War II, whether they were registrants under the law or were on active duty.

In his appearance, on behalf of the Association, before the Armed Services Committee of the House of Representatives on 24 April 1953, and again before the Senate Armed Services Committee on 20 May 1953, Dr. Edwin S. Hamilton said, in part:

> Inasmuch as the registrants in priority II, with the exception of those having temporary deferments, have been called into service, it would appear that the only remaining way in which a measure of equity can be

From the Council on National Emergency Medical Service of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense.—*Editor.*

> insured in these cases is by establishing a shorter tour of duty for those physicians who had substantial service during World War II. The Association is, therefore, recommending that the period of duty required of medical registrants or reservists who are recalled to military service be limited to 12 months if they had 12 or more months of service since September 16, 1940.

In enacting Public Law 84, 83d Congress, the Congress adopted staggered periods of service for physicians including those in priority II. This obviously did not comply with our recommendations in this regard.

With the increase in the number of inquiries from physicians thus effected, and the lull in Selective Service activities because of a temporary surplus of physician applicants, it was believed that the Department of Defense would be receptive to our recommendation concerning the reduction in the period of service required of physicians with substantial military duty during World War II. Inasmuch as the periods of required service specified in Public Law 84 are maximum periods only, it is apparently possible to reduce the required period of service by administrative regulations.

For these reasons, a letter was written to Dr. Melvin A. Casberg, then Assistant Secretary of Defense (Health and Medical), on 18 December 1953 restating the recommendation quoted above. It was suggested that this reduction should apply to priority II physicians whether they are on active duty at the present time or whether they are in a deferred status.

The latest communication which the Council has received in this regard is a letter dated 28 December 1953 from Dr. Casberg, which states:

> This is in reply to your letter of December 18, 1953 recommending the early release of priority II physicians in the Armed Forces who had twelve months or more of service during World War II. Consideration will be given to your recommendations.

It is the hope of the Council that suitable administrative regulations will be promulgated in the near future.

EDITOR'S NOTE: It has already been announced that the Army will need about 4,500 medical officers during Fiscal Year 1954. The requirements for the Army will begin about December 1954. An appeal has been published in the *Journal of the American Medical Association*, the *Journal of the Student American Medical Association*, *Journal of the American Hospital Association*, *Journal of Medical Education*, and the *Journal of the American Dental Association* urging interns finishing on June 30 of this year to volunteer for active duty in the Air Force and Navy because vacancies already exist in these two services.

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES

Armstrong, G. E., Maj. Gen., MC, USA, and Mason, J. B., Col., MC, USA: The physician's stake in Army Reserve Program. *J. A. M. A.* 154: 578-581, Feb. 13, 1954.

Brown, C. T., Lt. Col., MC, USA: Tobacco addiction; suggestion as to its remedy. *Texas J. Med.* 50: 35-36, Jan. 1954.

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BOOK REVIEWS

PERIPHERAL NERVE INJURIES, Principles of Diagnosis, by *Webb Haymaker,* M. D., and *Barnes Woodhall,* M. D. 2d edition. 333 pages; 272 illustrations. W. B. Saunders Co., Philadelphia, Pa., 1953. Price $16.

The second edition of this sterling contribution to the diagnosis of peripheral nerve injuries has been revised and augmented with many new illustrations and about a hundred additional pages.

The book is composed of four sections, of which the first provides an anatomic background for peripheral nerve examination on a segmental basis, employing numerous detailed diagrams indicating the skin, muscle, and skeletal relationship. The second section describes and illustrates the method of examining an acute peripheral nerve injury, naming the muscles, nerves, and spinal segments involved. The third section is concerned with the classification of nerve injuries on a pathologic basis. It describes the various special tests presently used in diagnosis and prognosis, and the manifestations of nerve injuries such as muscular atrophy irritative phenomena, alterations in sensibility and autonomic activity, trophic disorders, contractures, and pain. The final section deals with the diagnosis of injuries to plexuses and peripheral nerves after sufficient time has elapsed for anatomic changes to have taken place.

The book is profusely illustrated with diagrams of plexuses and nerves, and with photographs showing deformities and cutaneous sensory defects resulting from nerve injuries. This book is a "must" in the library of every hospital of the armed services and should be on the reference shelf of every civilian physician in traumatic surgery.

—W. J. JAMES, *Comdr., (MC) USN*

MEDICAL TREATMENT OF DISEASE, by *Henry A. Christian,* M. D., LL. D.; *Dale G. Friend,* M. S., M. D.; and *Maurice A. Schnitker,* M. D. Volume VIII of Oxford Loose-Leaf Medicine. 965 pages. Oxford University Press, New York, N. Y., 1953. Price $25.

Because of the periodic acceptance of new concepts, methods, and tools in medicinal treatment, a loose-leaf volume has much to recommend it. The preface states: "A loose-leaf book such as this makes changes easy and inexpensive, since the purchaser may simply obtain revised pages for insertion in the volume" and revisions are to "be prepared whenever important changes in treatment are found clinically worth while."

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The 12 parts and 80 chapters include those conditions which are in the province of the internist and the physician. They present, usually in narrative style, the essential features of the therapeutic and prophylactic measures that in the opinion of the authors have proved clinically effective for the hundreds of specific situations considered. The methods described are for the most part conventional and in general agreement with other current and authoritative sources. The metabolic, cardiovascular, and gastrointestinal sections are particularly well done. Each chapter has a short bibliography and the entire book is covered by an abbreviated index. There are already several excellent books on medical treatment available and this one covers the same extensive field with a thoroughness similar to that of these other reputable texts. Its advantage is that it is loose-leaf and accordingly can be kept up to date. —J. H. WARD, Jr., *Capt. (MC) USN*

THE PRACTICAL MANAGEMENT OF DIABETES, by *Edward Tolstoi*, M. D.; edited by *Paul Gyorgy*, M. D.; *Louis Leiter*, M. D.; and *S. O. Waife*, M. D. 93 pages. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $3.25.

In this monograph the author presents his views on the controversial subject of the "free diet" in conjunction with prolonged-acting insulin in the management of the diabetic patient. The criteria of satisfactory control of diabetes, as the author states, lies in the triad of freedom from diabetic symptoms, maintenance of weight, and absence of ketonuria. Relatively little emphasis is placed on the importance of hyperglycemia or glycosuria as indications for adjusting the diet or insulin dosage.

The opening chapter is devoted to a brief historical review of the management of diabetes and of those therapeutic goals in vogue during the period preceding the discovery of insulin in 1923. This is followed by the author's "clinical method" of management of the patient with uncomplicated diabetes, employing the "free diet" and intelligent disregard for hyperglycemia and glycosuria. Succeeding chapters deal with the manipulation of treatment required in the diabetic patient with acute and chronic complications. The last chapter, titled "Hyperglycemia and Glycosuria; Do They Cause So Called 'Diabetic Complications' in the Insulin-Treated Patient?", will invoke careful thought and critical consideration. The monograph contains no tables of food composition or caloric values, and no formulas for food allowances or diet prescription based on the nutritional status or caloric requirements of the diabetic patient. While a few case histories serve to illustrate the clinical progress of patients under the author's method of diabetic management, there are no statistical data relating to the infrequency of acute and chronic diabetic complications which might lend support to the author's method.

This inexpensive and well-written monograph should be read by any physician who has the responsibility of caring for diabetic patients,

because the author is a pioneer and champion of the "free diet" school of diabetic management.—E. C. KENNEY, *Capt. (MC) USN*

PHYSIOLOGY OF MUSCULAR ACTIVITY, Originally by *Edward C. Schneider*, M. P. E., Ph. D., D. Sc. By *Peter V. Karpovich*, M. P. E., M. D. 4th edition. 340 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953.

This book, a complete revision of the third edition, was written for the student of physical education and those who are concerned with the reaction of the body to physical activity. The author is ably qualified to discuss the medical implications of his subject as well as to express the viewpoint of the physical educationalist. Anatomy, physiology, chemistry, and kinematics of muscles are briefly discussed, but the author states that, for a complete understanding of the secondary effects of muscle activity, a knowledge of the metabolic integration of the respiratory, nervous, and cardiovascular systems is essential. These topics are presented in a manner designed to be helpful to coaches, physical educationalists, athletes, and team physicians. The book is not sufficiently detailed nor is the subject matter pertinent enough to attract doctors of medicine as a group; however, it is full of little-known but authoritative facts and results of investigations concerned with fatigue, fitness tests, environmental influence, and other relative subjects which will serve as a concise reference.

Doctor Karpovich has written a well-organized book in a lucid and straightforward style. The illustrations and charts are adequate, clear, and appropriate throughout. He cites many authors in allied fields, and includes 467 references in his bibliography.

—H. B. LUSCOMBE, *Col., MC, USA*

ESSENTIALS OF NURSING, by *Helen Young*, R. N., and *Eleanor Lee*, A. B., R. N. Edited by *Helen F. Pettit*, R. N., M. A. 527 pages. G. P. Putnam's Sons, New York, N. Y., 1953. Price $4.

Written by two professional nurses, the new edition of this book should be valuable for the beginning student nurse. The first part of the book gives a general introduction to hospital administration, and is followed by a discussion of routine procedures, including the admission and discharge of patients. The section on diagnostic and therapeutic procedures is comprehensive, and the nurse's role as an assistant to the physician in certain procedures is particularly well defined. A chapter on rehabilitation has been added to this edition.

Throughout the book the sociologic and psychologic approach to nursing care is emphasized. Illustrations in this book include some excellent line drawings with parts of equipment well labeled. Although a glossary is not included in the book, terms are well defined and subjects are easily located in the index. Nursing instructors should find this book of value either as a text or reference in basic nursing classes. —A. T. BELL, *Capt., USAF (NC)*

CLINICAL MANAGEMENT OF BEHAVIOR DISORDERS IN CHILDREN, by *Harry Bakwin*, M. D., and *Ruth Morris Bakwin*, M. D. 495 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1953. Price $10.

This book will be of special value to the medical officer assigned to a station where no psychiatrist or psychologist is available. Early chapters are devoted to the description of the growth, development, and psychologic care of the newborn infant and child, followed by an excellent discussion of the treatment of the physically ill and handicapped child. Behavior disorders are described in clinical terms, and cause, diagnosis, and treatment are discussed thoroughly. The diagnostic section has been emphasized by the authors, in order to enable the physician to establish his own conclusions. Included are material for interviewing, history taking, graphic tests, examination, and projective technics which should prove useful. Problems related to mental functioning and emotional development are given considerable attention, as are developmental abnormalities. A brief but interesting chapter on organic disturbances with a large psychic component, such as asthma, dermatoses, and ulcerative colitis, is provided.

The material is well organized, concise, and complete, with a double-column format of very readable type with heavy subtitling. Illustrations are few but well selected. An extensive subject index and list of references, including 23 general texts, are provided. The authors have succeeded in presenting a very readable book, with cause, diagnosis, treatment, and general considerations described in clinical terms and integrated with the total care of the child.

—M. KURZROK, *Comdr., (MC) USN*

MODERN TRENDS IN UROLOGY, edited by *E. W. Riches*, M. C., M. S., F. R. C. S., with a foreword by Lord *Webb-Johnson*, K. C. V. O., C. B. E., D. S. O., T. D., M. B., LL. D., F. R. C. S. 476 pages; illustrated. Paul B. Hoeber, Inc., New York, N. Y., 1953. Price $12.50.

This latest addition to the Hoeber Modern Trend Series is made up of 38 sections, each written by an expert who has won universal recognition in his particular specialty. Excellent discussions are included on anesthesia in urological surgery, radiological therapy of vesical neoplasms, the urological aspects of gynecology, and advances in radiology of the urinary tract by authorities in these fields, rather than by urologists. Except for the sections by one American and one Swedish author, the text is written by outstanding authorities of the British Empire. In general, the views of these observers coincide well with those held by American urologists. Of particular note is their advocacy of the trend away from radical surgical methods (*i. e.*, total cystectomy and ureteral transplantation) in all but a certain carefully selected group of patients with vesical neoplasms.

For some reason, a discussion of neoplasms of the external genitalia is omitted, although the somewhat controversial topic of the treatment

(radical surgical and radiological) of the various types of tumor of the testis has been widely considered in urological writing during the past few years.

References are furnished at the end of each section; both American and European publications have been consulted thoroughly. The section on the cause and prevention of urinary calculi is particularly notable for its thoroughness, and its concise and lucid exposition of a perplexing and complicated problem. The volume is beautifully printed and illustrated, and it will be of greatest interest to the resident and to the practitioner. It is not intended to supplant a larger textbook devoted to a complete consideration of the basic principles as well as to the practice of this comprehensive specialty. As a complete study of recent advances in this important field, this timely volume is highly to be recommended to the general as well as to the genitourinary surgeon.—S. JOHNSON, *Capt., (MC) USN*

SYMPTOMS OF VISCERAL DISEASE, A Study of the Vegetative Nervous System in Its Relationship to Clinical Medicine, by *Francis Marion Pottenger,* M. D., LL. D. 7th edition. 446 pages; with 87 text illustrations and 10 color plates. The C. V. Mosby Co., St. Louis, Mo., 1953. Price $7.50.

This monograph on the anatomy, physiology, and pharmacology of the autonomic nervous system and the part it plays in producing the symptoms of visceral disease is the seventh revision of a work first published in 1919. Earlier editions, based on the premise that clinicians generally had ignored the autonomic nervous system in its relation to clinical medicine, emphasized its importance in the understanding of symptoms produced by disease. The new edition is produced especially for those interested in visceral reactions to stimuli. The author points out the necessity of studying the patient and his reactions, as well as the disease process itself, and presents a careful study of the reactions of man to stimuli from his internal environment.

The concept of viscerogenic reflexes, especially those resulting from pulmonary disease, is covered in detail, as is the anatomy and physiology of the vegetative nervous system. Pharmacology is discussed briefly, but is not up to date.

The pleasure of reading the monograph is marred by references to "recent literature" which was published in 1919 or 1922. Otherwise, it is an interesting book for those who wish to study the history of the development of knowledge of the autonomic nervous system and to learn many facts and opinions on its function. For more recent information, the student will have to look elsewhere. The book is attractively printed and bound, and the illustrations are excellent.

—E. V. JOBE, *Capt., (MC) USN*

SECTIONAL RADIOGRAPHY OF THE CHEST, by *Irving J. Kane*, M. D.; foreword by *Edward D. Churchill*, M. D. 154 pages; illustrated. Springer Publishing Co., Inc., New York, N. Y., publishers, 1953. Price $7.50.

This short text presents a subject of primary interest to the radiologist. It consists of four chapters, a section of illustrations, and a lengthy bibliography. The chapters are brief and are actually more of an outline than a detailed analysis of principles and methods, selection of positions and levels, anatomy, and pathology. The author stresses the importance of planigraphy in diagnosis, of precise localization by lung segments, and of evaluation of therapeutic procedures.

The illustrations are excellent, and include simple diagrams where necessary. Comparative films taken by conventional methods are interposed to stress an important point. The quality of the reproductions of cross-sectional films is the best feature of the book.

This test will be of value to the radiologist interested in planigraphy, and also to the chest physician and thoracic surgeon.

—W. S. COLE, *Comdr., (MC) USN*

THE YEAR BOOK OF RADIOLOGY, edited by *John Floyd Holt*, M. D.; *Fred Jenner Hodges*, M. D.; *Harold W. Jacox*, M. D.; and *Vincent P. Collins*, M. D. 462 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $8.

This book consists of abstracts of articles published between June 1952 and June 1953. It has two main divisions on diagnosis and radiation therapy.

The text is easy to read and understand. Frequently the editors add a footnote to the abstracted articles, giving their own experiences and opinions. The reproductions of radiographs are excellent and the best that I have seen in any publication. This is partially due to the very high quality of the paper used in the book throughout.

This volume is interesting, helpful and stimulating. It is a must for all radiologists and should prove valuable to all physicians concerned with radiology in any of its aspects.

—H. A. VINSON, *Lt. Col., MC, USA*

SURGERY OF REPAIR AS APPLIED TO HAND INJURIES, by *B. K. Rank*, M. S., and *A. R. Wakefield*, M. S. 256 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1953. Price $8.

This interesting and easily read book by two Australian surgeons discusses the general considerations of primary treatment of various types of open hand injuries. The principles as outlined are rational and eliminate some of the confusion that a general surgeon experiences when confronted with massive hand injury. The division into tidy and untidy hand injuries is helpful.

The chapter on surgical anatomy, and examination and appraisal of of the injury, reiterates established principles with reference to tendon

repair, nerve repair, and conservation of hand tissue, indicating that even though a useful digit may not result, such conserved skin can be used in secondary plastic procedures to obtain a useful extremity. The point is well taken that hand skin is different from any other skin. The discussion on intermediate treatment of unhealed wounds and on massive necrosis of the hand is timely and important, and the sections on secondary treatment and plastic procedures for reconstruction of the hand include the indications for further reconstruction. The concluding portion on stumps, burned hand, hand injuries in children, and hand prosthesis is useful for ready reference.

This book cannot be classified as a primer for hand injuries; yet the subject matter is presented so clearly and concisely that it is recommended reading for all surgical residents and industrial surgeons, as well as for the general and orthopedic surgeon who may have occasion to treat hand injuries. The reader will not be lost in a mass of detail, so that it is a handy book to have close to the operating room for a quick review.—V. C. STRATTON, *Comdr. (MC) USN*

MODERN CLINICAL PSYCHIATRY, by *Arthur P. Noyes*, M. D. 4th edition. 609 pages. W. B. Saunders Co., Philadelphia, Pa., 1953. Price $6.

The author of the fourth edition of this standard American textbook is President-elect of the American Psychiatric Association. Such current topics as ACTH, reactions to isoniazid, compensation neuroses, child psychiatry, and combat neuroses are covered in brief. The book follows the standard nomenclature officially adopted by the American Psychiatric Association.

Dr. Noyes's viewpoint is holistic, though one sees the influences of both Freud and Meyer throughout the text. The author states that "No one theory does justice to all the problems presented by psychiatry." Much attention is paid to a presentation of basic dynamic principles, *e. g.*, mental mechanisms and processes rather than "disease entities" are emphasized. The author emphasizes the interrelationships of psychiatry with respect to some of the clinical problems in the general medical and surgical areas, stating "It would be a happy combination if as much effort were expended in the psychological treatment of preoperative fear and apprehension as there is in the search for a drug to alleviate them."

This book should have a wide range of usefulness. Both the medical student and the psychiatric resident will find it helpful, and the nonpsychiatric physician will find it a ready reference. Those physicians preparing for specialty board examinations will find here an extensive practical review.

The style is narrative and easy to read. The book is an excellent presentation in textbook form of modern American psychiatry, but a chapter on medicolegal problems in psychiatry would be a valuable inclusion in the next edition.—M. SHOOR, *Comdr., (MC) USN*

DIAGNOSIS AND LOCALIZATION OF BRAIN TUMORS, A Clinical and Experimental Study Employing Fluorescent and Radioactive Tracer Methods, by *George E. Moore*, M. D., Ph. D. 241 pages; 87 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $10.50.

This monograph dealing with the new and rapidly expanding subject of the application of radioactive materials to clinical practice is timely, practical, and well written. In the 11 main sections of the book the author discusses the use of fluorescent materials in delineating intracranial neoplasms at the operating table, the preoperative application of radioactive tracer substances for the diagnosis and localization of both neoplastic and non-neoplastic lesions, the technic (with hazards and pitfalls) of isotope encephalometry, and the methods by which the blood brain barrier may be studied with such materials. The use of diiodofluorescein (sodium) and the available mechanical apparatus for its clinical and experimental application are described in detail. The sources of error, however, in the use of this substance are succinctly pointed out.

This book includes most of the data now available concerning the application of radioactive compounds both at the bedside and in the laboratory. The author's enthusiasm, though justified by his own fruitful researches, is tempered by his thoughtful recognition of the limitations of these new technics. He leaves no doubt in the reader's mind that the procedures described must be regarded both as promising and challenging to the neurosurgeon. The book is well illustrated, well indexed, and is the usual fine product of the publisher.

—J. MARTIN, *Col., MC, USA*

NUTRITIONAL STUDIES IN ADOLESCENT GIRLS AND THEIR RELATION TO TUBERCULOSIS, by *Joseph A. Johnston*, M. D. 320 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $7.50.

This is the well-documented record of a painstaking 20-year nutritional study on adolescent girls, most of whom had tuberculosis, with the prime purpose of determining the influence of "soil" in the development of tuberculous disease. The author's stated objectives were: (1) to follow, by roentgenographic examination, children after their removal from the contact of their first infection; (2) to study the growth process in adolescence as reflected in the nitrogen and calcium balances; (3) to determine the nitrogen and calcium balances and the basal metabolism of tuberculous adolescents and to correlate these with the clinical course of their disease, and (4) to observe the effect, on the course of the disease, of changes induced in the balances by dietary and other means.

The author attempts to show that the vulnerability of the adolescent girl to tuberculosis is related to a failure to meet the nutritional requirements for growth peculiar to this period, and that the disease process may be favorably influenced by the degree to which one suc-

ceeds in replenishing previously acquired deficiencies and promoting a normal nutritional state.

The book is profusely illustrated with graphs and charts, and includes detailed clinical histories. It is a valuable contribution to the epidemiology of tuberculosis and can be read profitably by pediatricians and nutritionists.—C. W. TEMPEL, *Col., MC, USA*

MAY'S MANUAL OF THE DISEASES OF THE EYE, For Students and General Practitioners. 21st edition, revised and edited by *Charles A. Perera*, M. D. 512 pages; 378 illustrations, including 32 plates, with 93 colored figures. Williams and Wilkins Co., Baltimore, Md., 1953. Price $6.

This book sets forth in a clear, concise, easy-to-read manner the tenets of ophthalmology, including the basic sciences, diagnostic criteria, and therapeutics. Its 21 American editions plus many foreign releases testify to its long term acceptance and popularity. Dr. Perera has continued the same high quality of presentation that characterized the output of the late Dr. May.

Despite its relatively small size, this is probably the most complete, simplified textbook of any medical specialty. Items of particular worth include a simple differential diagnosis of the acute red eye, the latest methods of treatment of the uveitides (including the use of cortisone and ACTH) and a section on refraction. An appendix cites the current ocular requirements for admission to the different branches and sections of the United States Armed Forces.

The place of this textbook in the teaching of ophthalmology to medical students is well established, while its use as a reference book for general practitioners and optometrists is widespread. Medical officers of the Armed Forces, especially those stationed where the services of an ophthalmologist are unavailable, would be well advised to have a copy within reach. Its value as a textbook and as a reference for all but the expert ophthalmologist is unsurpassed.

—L. SCHACHNE, *Lt. (MC) USN*

PREGNANCY WASTAGE, Proceedings of a Conference Sponsored by the Committee on Human Reproduction, National Research Council. Edited by *Earl T. Engle*. 254 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $8.50.

This volume is a collection of articles of particular interest to obstetricians, pediatricians, pathologists, embryologists, and those specializing in public health, as the unique title would indicate.

It represents an attempt to co-ordinate the findings and viewpoints of the myriad of workers whose particular specialties contribute in some way to the problems involved after fertilization and up to the neonatal period of life. There are 15 articles, the longest 35 pages, dealing with rather recent data on the subject. The comments appended to most of the articles are pertinent and, in most instances, by authorities in

this field. It is a stimulating compilation of thought and data which should be repeated at intervals in volume form. Most of the articles have a reference source usually preceding the discussion by participants in the conference or by the chairman, and are accompanied by pertinent figures, graphs, charts, or tables. A comparison of statistics on this problem from leading institutions is presented, particularly with reference to the geographic pecularities involved. An introduction to the statistics of abortion is most interesting and enlightening.

If salvage of fetal life is to be improved, a statistical analysis of the problem, followed by the investigation of the physiopathology involved and its ultimate correction, is in order. This will require the concerted effort of individuals as attested by the participants in these proceedings.— H. L. RIVA, *Lt. Col., MC, USA*

THE NURSING OF THE ELDERLY SICK, A Practical Handbook of Geriatric Nursing, by *T. N. Rudd,* M. D. 108 pages. J. B. Lippincott Co., Philadelphia, Pa., 1953. Price $2.50.

This book deals with certain aspects of the problems of disease in the elderly, as they affect nursing care. The author considers that the approach to the aged sick should differ in many respects from that to any other group of patients. Emphasis is placed on: (1) maintenance of independence of mind and body; (2) keeping the elderly patient out of hospitals as much as possible; (3) psychologic aspects involved in geriatric nursing; and (4) acceptance of "team concept" by personnel in treatment of the aged in hospital. The author deplores the tendency of hospital personnel to regard nursing of the aged as less desirable duty than caring for younger patients, thus causing the elderly to be shunted aside with a minimum of care. Several abbreviations and terms are employed that are not in common usage in hospitals in the United States, such as "S. R. N.," "S. E. A. N.," "almoner," "frail ambulant," and "long stay annexes."

This book is not suitable for a reference handbook in clinical teaching in military hospitals. Although it brings out many important aspects of the care of the aged sick, it is both too elementary for the trained professional nurse, and too complicated for unskilled auxiliary hospital personnel. It would be useful, however, to the student nurse as additional reading material in her first year of training. It also would be valuable to those primarily interested in specializing in geriatric nursing.—D. KUDRITZEN, *Lt. (NC) USN*

REGIONAL BLOCK, A Handbook for Use in the Clinical Practice of Medicine and Surgery, by *Daniel C. Moore,* M. D. 373 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $11.

According to the author this book presents "a concise outline of the everyday phases of regional analgesia" in the clinical practice of medicine and surgery and "is intended for the beginner." In view of this stated purpose it is difficult to understand why the author includes technics which are definitely not for the beginner or even for the oc-

casional anesthetist. As an example there is a chapter on spinal absolute alcohol block, which the author concludes with the statement that "spinal alcohol injections are often unsatisfactory (and) should be limited to larger institutions or specialists whose reputation * * * can compensate for poor results."

The book is profusely illustrated with excellent photographs and drawings but the high gloss paper necessary for their clear reproduction makes reading difficult. This book will be a valuable aid in teaching but it should not be used without supervision. The part-time anesthetist will find the book's illustrations of great help if he is not tempted by them to overreach his limitations.

—D. E. MacQUIGG, *Maj., MC, USA*

PEDIATRIC GYNECOLOGY, With Sections on Urology and Proctology, by *Goodrich C. Schauffler,* M. D. 3d edition. 318 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1953. Price $7.50.

In this third edition of *Pediatric Gynecology* the author presents a clear and simple discussion of material that most pediatric and gynecologic texts cover in a hazy and fragmentary manner. The subject matter is divided into fourteen chapters. In these the author has organized his material well and presents it with a definite sense of humor, in an easily read style. He describes successively the methods of gynecologic examination, the genitalia, diagnosis and treatment of vaginitis, disorders of adolescence, female urology, proctology, and the medicolegal aspects of pediatric urology.

Because of its practical nature this book should be of definite interest both to general practitioners and to pediatricians.

—A. T. HENDERSON, *Lt. Comdr. (MC) USN*

GOURMET COOKING FOR CARDIAC DIETS, by *Florence Field.* 350 pages; decorations by *Vee Guthrie.* The World Publishing Co., Cleveland, Ohio, 1953. Price $3.50.

This book provides recipes and valuable information for planning, preparing, and serving palatable food for cardiac patients on restricted diets. Detailed guidance in the management of low-calorie, sodium-restricted, low-fat low-cholesterol, low-cholesterol, and low-purine diets is outlined. Included in the book are many diet lists, menu patterns, household hints, charts, and tables in addition to recipes for the preparation of diet foods. One chapter of the book is devoted to reducing diets and is valuable not only to the cardiac patient but also to any person who wishes to lose weight.

Because the author maintains that food prepared for cardiac patients can taste good, and can be enjoyed, with slight modifications, by all members of the family, the patient who reads and uses this book will find it an easy and practicable guide in following the doctor's diet prescription.

The book is written to appeal to the lay person, has a realistic approach to diet problems, and provides a source of accurate information necessary for providing good food for patients placed on cardiac diets.

—F. M. GASSON, *Capt., USAF (WMSC)*

THE GREEN AND RED PLANET, A Physiological Study of the Possibility of Life on Mars, by *Hubertus Strughold,* M. D., Ph. D. 107 pages; illustrated. The University of New Mexico Press, Albuquerque, N. Mex., 1953. Price $4.

An aircraft flying at 55,000 feet is in a terrestrial environment similar to that of Mars, "the green and red planet," which is the subject of this speculative study on the possibility of life beyond the earth. Widely known for his scholarly and philosophic writings of space medicine, the author carefully reviews present knowledge of the nature of the atmosphere surrounding Mars, and its pressure, temperature, and ecology. He cautiously proposes that there is "a reasonable basis for the assumption that a form of vegetation can survive and maintain itself on that none-too-hospitable planet" and provide the "green" which is seasonably noted by astronomers. But he quickly adds that the possibility of visitors from Mars is so remote that it remains in the realm of fantasy.

This small volume will appeal to all bioscientists who have ever looked into the heavens on a starry night and wondered what secrets the distant planets hold. Dr. Strughold, in providing some of the answers, concludes that life as we know it does not exist on Mars. The volume is attractively illustrated and contains an adequate bibliography of related publications in astrophysics and aviation medicine.

—R. J. BENFORD, *Col., USAF (MC)*

AUTOPSY DIAGNOSIS OF CONGENITALLY MALFORMED HEARTS, by *Maurice Lev,* M. D. 194 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $7.50.

This is a monograph intended as a guide for the use of pathologists, anatomists, embryologists, and cardiologists. It is divided into three parts on dissection and examination of the congenitally abnormal heart, individual abnormalities, and pathologic complexes. Suggested readings on congenital cardiac malformation are listed for the reader who desires to study further a certain condition. Not meant to be an exhaustive study of the pathologic lesions of the malformed heart, this book is a well-illustrated and simply-written guide for the prosector and clinician. The notes on pathogenesis are of interest and worth while, and the inclusion of normal material assists the reader to orient himself rapidly.

Because congenital heart disease has assumed great importance in recent years due to advances in its diagnosis and correction, careful dissection and study of this organ is not the futile experience it once seemed to be.—D. M. KUHNS, *Col., MC, USA*

NEW BOOKS

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

FIRST REPORT OF THE USAF MEDICAL SERVICE, 1 July 1949 - 30 June 1952. Prepared by *The Office of the Surgeon General, United States Air Force,* Washington, D. C. 287 pages. U. S. Government Printing Office, Washington, D. C., publishers, 1954. Price $0.70.

CHILD HEALTH AND THE STATE, by *Alan Moncrieff,* C. B. E., M. D., F. R. C. P., J. P., Nuffield Professor of Child Health, University of London; Physician, The Hospital for Sick Children, Great Ormond Street, London. London School of Hygiene and Tropical Medicine Newsholme Lectures 1953. 48 pages. Oxford University Press, New York, N. Y., 1953. Price $1.50.

ORAL HYGIENE, by *Russell W. Bunting,* D. D. Sc., Professor of Dentistry and Dean of the School of Dentistry, Emeritus, University of Michigan, and *Collaborators.* 2d edition, thoroughly revised. 283 pages; 204 illustrations and a color plate. Lea & Febiger, Philadelphia, Pa., 1954. Price $5.50.

UNDERSTANDING THE JAPANESE MIND, by *James Clark Moloney,* M. D. 252 pages. Philosophical Library, Inc., New York, N. Y., 1954. Price $3.50.

THE PSYCHIATRIC AIDE, His Part in Patient Care, by *Alice M. Robinson,* R. N., M. S., Director of Nursing Service and Nursing Education, Boston State Hospital; Foreword by *Walter E. Barton,* M. D. 186 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $3.

INTENSIVE GROUP PSYCHOTHERAPY, by *George R. Bach,* Ph. D.; Clinical Psychologist; Formerly Assistant Professor of Psychology, University of Southern California. 446 pages. The Ronald Press Company, New York, N. Y., 1954.

DISEASES OF THE KNEE, Management in Medicine and Surgery, by *Anthony F. DePalma,* M. D.; James Edward Professor of Orthopedic Surgery and Head of the Department, Jefferson Medical College, Philadelphia; Attending Orthopedic Surgeon, Jefferson Medical College Hospital, Philadelphia; Attending Orthopedic Surgeon, Methodist Episcopal Hospital, Philadelphia; Chief Orthopedic Surgeon (Rotating), Philadelphia General Hospital; Consultant Orthopedic Surgeon, New Jersey Orthopedic Hospital; Consultant Orthopedic Surgeon, Veterans Hospital, Philadelphia. 840 pages; 455 illustrations. Drawings by *Carl Brill.* J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $20.

THE OFFICER'S GUIDE, 20th edition, A Ready Reference on Customs and Correct Procedures Which Pertain to Commissioned Officers of the United States Army. 569 pages; illustrated. The Military Service Publishing Co., Harrisburg, Pa., 1954. Price $4.

HEADACHE, Diagnosis and Treatment, by *Robert E. Ryan,* B. S., M. D., M. S. (in Otolaryngology), F. A. C. S.; Department of Otolaryngology, St. Louis University; Former Fellow of Mayo Clinic, Rochester, Minn.; Associate Otolaryngologist, St. John's Hospital; Assistant Otolaryngologist, St. Louis University Group of Hospitals, St. Louis, Mo.; Diplomate, American Board of Otolaryngology; Fellow of American Academy of Ophthalmology and Otolaryngology. 338 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $6.50.

UROLOGICAL PRACTICE, by *Roger W. Barnes,* B. A., M. S., M. D., F. A. C. S., F. I. C. S.; Professor of Surgery (Urology) and Chairman of the Section on Surgery, School of Medicine, College of Medical Evangelists; Chief of Urology Service, White Memorial Hospital; Senior Attending Surgeon, Los Angeles County Hospital; Attending Staff, Glendale Sanitarium and Hospital, Methodist Hospital, St. Francis Hospital, Good Samaritan Hospital; and *Henry L. Hadley,* B. A., M. D., D. N. B.; Assistant Clinical Professor of Surgery (Urology), School of Medicine, College of Medical Evangelists; Attending Staff, White Memorial Hospital, Los Angeles County Hospital, Glendale Sanitarium and Hospital, and Los Angeles County Farm; with contributions by *R. Theodore Bergman,* B. S., M. D., D. N. B., F. A. C. S., F. I. C. S.; *Clyde W. Collings,* M. D., F. A. C. S.; *Emil J. Krabulik,* B. Sc., M. D., F. A. C. S.; *Walter E. MacPherson,* B. A., M. D., D. N. B., F. A. C. P.; *John R. Paxton,* M. D., F. A. C. S.; and *Murray Russell,* B. S., M. D. 494 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $12.50.

MAN IN SOCIETY, Preface to Sociology and the Social Sciences, by *George Simpson,* Brooklyn College. 90 pages. Doubleday & Co., Inc., Garden City, N. Y., 1954. Price $0.95.

1954 MEDICAL PROGRESS, A Review of Medical Advances During 1953, by *Morris Fishbein,* M. D., editor. 345 pages. The Blakiston Co., Inc., New York, N. Y., 1954. Price $5.

NARCOTICS AND NARCOTIC ADDICTION, by *David W. Maurer,* Ph. D., Professor of English and the Humanities, University of Louisville; Lecturer on Narcotic Addiction and Criminal Argots, Southern Police Institute, Louisville, Ky.; and *Victor H. Vogel,* M. D.; Medical Officer in Charge, European Activities, U. S. Public Health Service, Paris, France; Formerly, Medical Officer in Charge, U. S. Public Health Service Hospital, Lexington, Ky. American Lecture Series, Publication Number 169, A Monograph in The Bannerstone Division of American Lectures in Public Protection. Edited by *LeMoyne Snyder,* M. D., Medicolegal Consultant, Lansing, Mich.; *Ralph F. Turner,* Associate Professor of Police Administration, Michigan State College, East Lansing, Mich.; *Charles M. Wilson,* Superintendent, Wisconsin State Crime Laboratory, Madison, Wis.; *O. W. Wilson,* School of Criminology, University of California, Berkeley, Calif.; and *Russell S. Fisher,* Office of Chief Medical Examiner, State of Maryland, Baltimore, Md. 303 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $7.50.

AN RH-HR SYLLABUS, The Types and Their Applications, by *Alexander S. Wiener,* M. D., F. A. C. P., F. C. A. P.; Senior Bacteriologist (Serology) to the Office of the Chief Medical Examiner of New York, N. Y.; Assistant Professor, Department of Forensic Medicine, New York University Postgraduate Medical School; Attending Immunohematologist, Jewish Hospital of Brooklyn. Modern Medical Monographs, No. 9. 83 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954. Price $3.75.

ANTISEPTICS, DISINFECTANTS, FUNGICIDES, AND CHEMICAL AND PHYSICAL STERILIZATION, edited by *George F. Reddish*, Ph. D., Sc. D. (Hon.), St. Louis College of Pharmacy and Allied Sciences, and Lambert Pharmacal Company Division of The Lambert Company, St. Louis, Mo. 841 pages; 71 illustrations; 130 tables. Lea & Febiger, Philadelphia, Pa., 1954. Price $15.

INTERNAL MEDICINE IN DENTAL PRACTICE, by *Bernard I. Comroe*, A. B., M. D., F. A. C. P., Late Associate in Medicine, Schools of Medicine and Dentistry in the University of Pennsylvania; *Leon H. Collins, Jr.*, A. B., M. D., F. A. C. P., F. C. C. P., Associate in Medicine, Schools of Medicine and Dentistry of the University of Pennsylvania; Member of the Chest Section, Hospital of the University of Pennsylvania; Visiting Physician, Philadelphia General Hospital; Consulting Physician, United States Veterans Hospital, Coatesville; and Attending Physician, United States Veterans Hospital, Philadelphia; Colonel, U. S. Army Medical Reserve Corps; and *Martin P. Crane*, B. S., M. D., Sc. D. (Hon.), Chief Physician, The Misericordia Hospital, Philadelphia; Reserve Consultant in Medicine to the U. S. Naval Hospital, Philadelphia; Captain, Medical Corps, United States Naval Reserve. 4th edition, thoroughly revised. 563 pages; 86 illustrations and 30 in color on 6 plates. Lea & Febiger, Philadelphia, Pa., 1954. Price $7.50.

RH-HR BLOOD TYPES, Applications in Clinical and Legal Medicine and Anthropology, Selected Articles in Immunohematology, by *Alexander S. Wiener*, M. D., F. A. C. P.; Senior Serologist to the Office of the Chief Medical Examiner of New York City; Assistant Professor in the Department of Forensic Medicine of the New York University Postgraduate Medical School; Attending Immunohematologist to the Jewish Hospital of Brooklyn; Attending Transfusionist to the Adelphi Hospital of Brooklyn. 763 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954. Price $11.50.

COLD INJURY, Transactions of the Second Conference, November 20-21, 1952, New York, N. Y., edited by *M. Irene Ferrer*, Assistant Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons. 242 pages; illustrated. Sponsored by the Josiah Macy Jr. Foundation, New York, N. Y. Printed by Corlies, Macy & Co., Inc., New York, N. Y. Price $4.

NERVE IMPULSE, Transactions of the Fourth Conference, March 4, 5, and 6, 1953, Princeton, N. J., edited by *David Nachmansohn*, M. D., Associate Professor of Neurology, Columbia University College of Physicians and Surgeons, New York, N. Y. 224 pages; illustrated. Sponsored by the Josiah Macy Jr. Foundation, New York, N. Y., 1954. Printed by Progress Associates, Caldwell, N. J. Price $4.

EXPERT COMMITTEE ON LEPROSY, First Report, World Health Organization Technical Report Series No. 71. 28 pages. World Health Organization, Geneva, Switzerland, publisher, 1953. Price $0.20.

EXPERT COMMITTEE ON BILHARZIASIS, First Report, World Health Organization Technical Report Series No. 65. 45 pages. World Health Organization, Geneva, Switzerland, publisher, 1953. Price $0.30.

REPORT OF WORKING GROUP ON HUMAN BEHAVIOR UNDER CONDITIONS OF MILITARY SERVICE, A Joint Project of The Research and Development Board and the Personnel Policy Board in the Office of the Secretary of Defense. Prepared by *Sidney Adams*, Ph. D.; *Jack Buel*, Colonel, USAF (MSC), Ph. D.; *Gordon Barclay*, Colonel, AGC, USA, Ed. D.; and *Percival Eaton McDowell*, Captain, USN, Chairman. 426 pages. Printed at U. S. Government Printing Office, Washington, D. C., 1953.

BREAKING PATTERNS OF DEFEAT, The Effective Readjustment of the Sick Personality, by *Richard L. Jenkins,* M. D., Chief of Psychiatric Research, Psychiatry and Neurology Service, Veterans Administration, Washington, D. C. 270 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., publisher, 1954. Price $6.75.

MUSIC THERAPY, edited by *Edward Podolsky,* M. D., Department of Psychiatry, Kings County Hospital, Brooklyn, N. Y. 335 pages; illustrated. Philosophical Library, New York, N. Y., 1954. Price $6.

COAL TAR AND CUTANEOUS CARCINOGENESIS IN INDUSTRY, by *Frank C. Combes,* M. D., Professor of Dermatology and Syphilology, New York University Post-Graduate Medical School; Director of Dermatology and Syphilology, Bellevue Hospital, New York, N. Y. American Lecture Series, Publication Number 186, A Monograph in American Lectures in Dermatology, edited by *Arthur C. Curtis,* M. D., Chairman, Department of Dermatology and Syphilology, University of Michigan, Ann Arbor, Mich. 76 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $2.75.

PHARMACOLOGY, by *J. H. Gaddum,* Sc. D., F. R. S., M. R. C. S., L. R. C. P., Professor of Pharmacology in the University of Edinburgh. 4th edition. Oxford Medical Publications. 562 pages; illustrated. Oxford University Press, New York, N. Y., 1953.

RETINAL CIRCULATION IN MAN AND ANIMALS, by *I. C. Michaelson,* Ph. D. (Glas.), F. R. F. P. S. (Glas.), D. O M. S. (Eng.); Advisor in Ophthalmology to the Government of Israel; Chief, Department of Ophthalmology, Government Hospital, Haifa; Formerly, Surgeon and Senior Pathologist, Glasgow Eye Infirmary; Formerly Lecturer in Clinical Ophthalmology to the University of Glasgow; with a Foreword by *Jonas S. Friedenwald,* M. D., Associate Professor of Ophthalmology, The Johns Hopkins Medical School. 146 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $6.75.

DERMATOLOGIC MEDICATIONS, by *Marguerite Rush Lerner,* M. D., Resident, Department of Dermatology, and *Aaron Bunsen Lerner,* M. D., Ph. D., Associate Professor of Dermatology, University of Oregon Medical School, Portland. 183 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $3.50.

MEDICAL HISTORY OF THE SECOND WORLD WAR. SURGERY, edited by by Sir *Zachary Cope,* B. A., M. D., M. S., F. R. C. S. United Kingdom Medical Series, edited by Sir *Arthur S. MacNalty,* K. C. B., M. D., F. R. C. P., F. R. C. S. 772 pages; illustrated. Her Majesty's Stationery Office, London, publisher, 1953. Price 80s. net.